GEO-IDE year 1 emphasis: integrating NOAA's gridded data

Steve Hankin, PMEL
Roland Schweitzer, contractor
Kevin O'Brien, UW/JISAO
Jeremy Malczyk, UW/JISAO
Ansley Manke, PMEL

GEO-IDE year 1 emphasis: integrating NOAA's gridded data

Data sources:

1. NOMADS aggregation (courtesy of Glenn R.)
2. Time series collections (courtesy of Roy)

9:30-11:30PM !!

GEO-IDE year 1 emphasis: integrating NOAA's gridded data

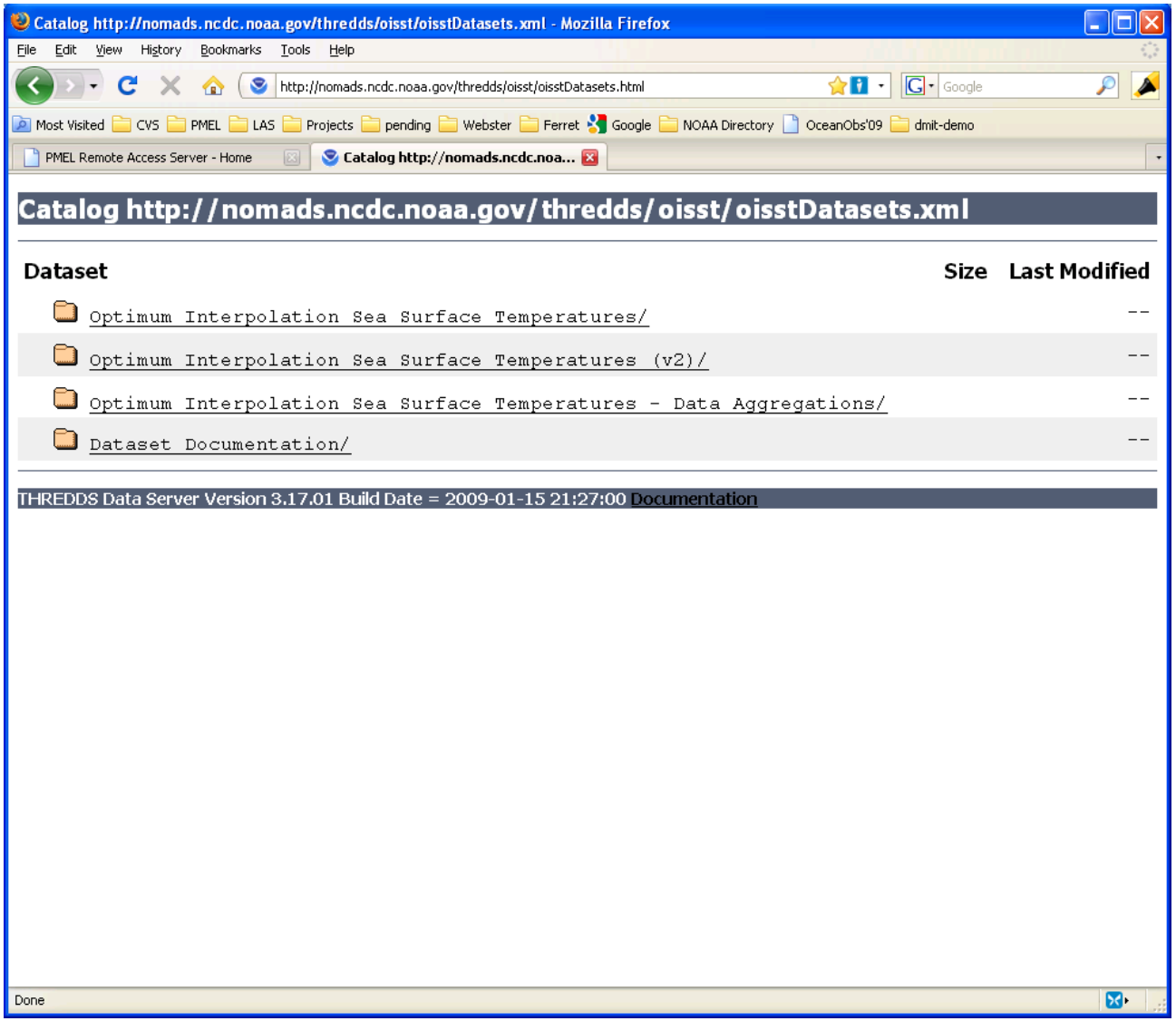
Themes of this demo (*):

1. THREDDS XML as the basis for customized discovery processes
2. Flexible access to grids from browsers (LAS demo)
   - Multi-dimensional access, averages/variability/extrema, comparison …
3. Segue to desktop access (micro-demo of Ferret)

(*) Well, Powerpoint … due to lack of WiFi and need for VPN

9:30-11:30PM !!

The NCDC NOMADS THREDDS catalog (html)


Catalog http://nomads.ncdc.noaa.gov/thredds/oisst/oisstDatasets.xml - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://nomads.ncdc.noaa.gov/thredds/oisst/oisstDatasets.html
Google
Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo
PMEL Remote Access Server - Home
Catalog http://nomads.ncdc.noa...
Catalog http://nomads.ncdc.noaa.gov/thredds/oisst/oisstDatasets.xml
Dataset
Size
Last Modified
Optimum Interpolation Sea Surface Temperatures/ --
Optimum Interpolation Sea Surface Temperatures (v2)/ --
Optimum Interpolation Sea Surface Temperatures - Data Aggregations/ --
Dataset Documentation/ --
THREDDS Data Server Version 3.17.01 Build Date = 2009-01-15 21:27:00 Documentation
Done

Building a catalog from a THREDDS tree (in LAS)

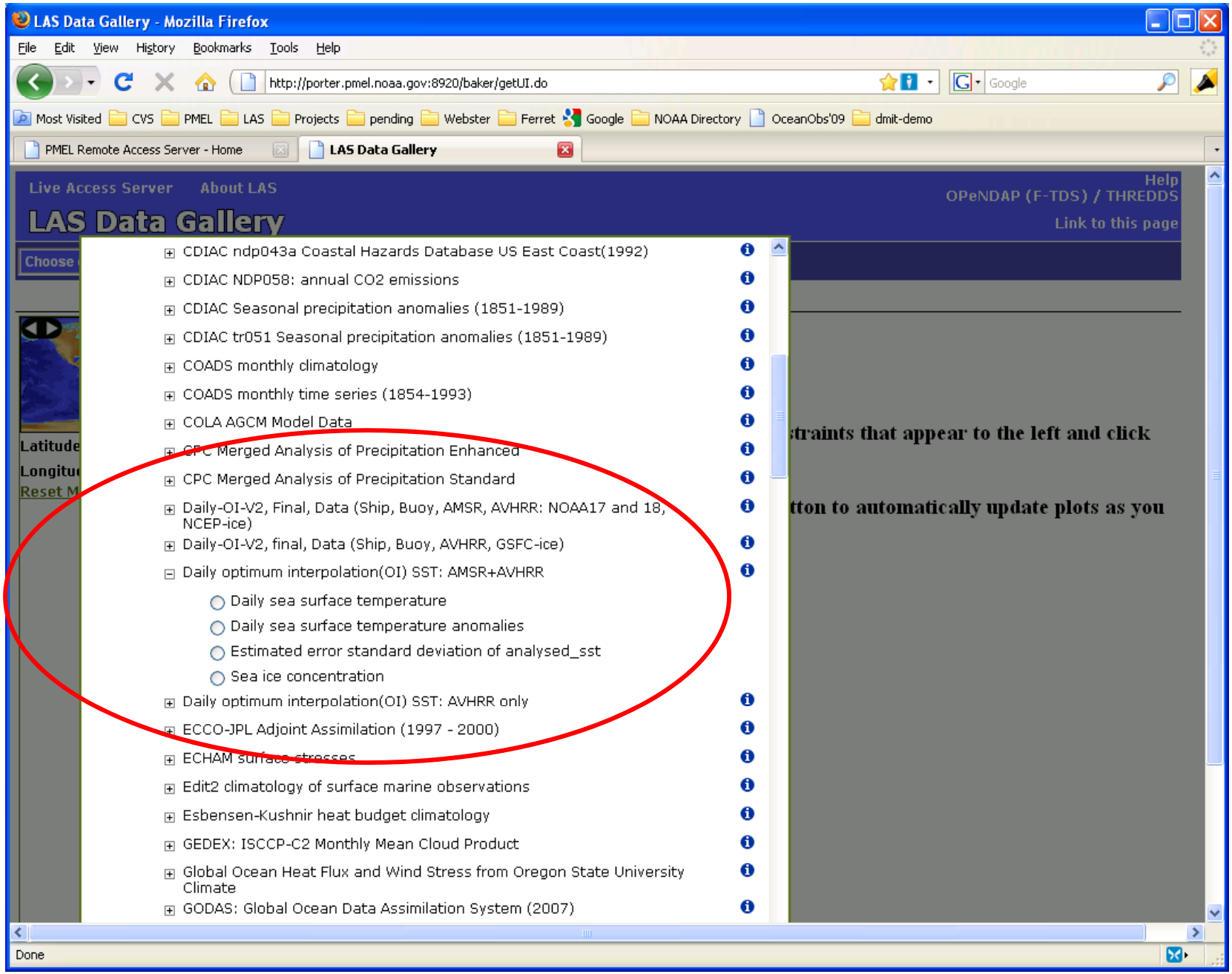
addXML.sh -t http://nomads.ncdc.noaa.gov/thredds/oisst/oisstAggs.xml

The addXML utility crawls the THREDDS catalog and extracts dataset “metadata” (sorry, Ted) into the LAS configuration:

Variables, units, grid coordinate systems

Reality Check

- The sub-catalog contained some data sets we were not interested in so we edited them out.
- A couple of the aggregations had problems with their metadata, so we fixed the configuration by hand and emailed the provider.
  - or could have used NcML to make the repairs


LAS Data Gallery - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/getUI.do
Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo
PMEL Remote Access Server - Home
LAS Data Gallery
Live Access Server About LAS
Help
OPeNDAP (F-TDS) / THREDDS
Link to this page
LAS Data Gallery
Choose
CDIAC ndp043a Coastal Hazards Database US East Coast(1992)
CDIAC NDP058: annual CO2 emissions
CDIAC Seasonal precipitation anomalies (1851-1989)
CDIAC tr051 Seasonal precipitation anomalies (1851-1989)
COADS monthly climatology
COADS monthly time series (1854-1993)
COLA AGCM Model Data
CPC Merged Analysis of Precipitation Enhanced
CPC Merged Analysis of Precipitation Standard
Daily-OI-V2, Final, Data (Ship, Buoy, AMSR, AVHRR: NOAA17 and 18, NCEP-ice)
Daily-OI-V2, final, Data (Ship, Buoy, AVHRR, GSFC-ice)
Daily optimum interpolation(OI) SST: AMSR+AVHRR
Daily sea surface temperature
Daily sea surface temperature anomalies
Estimated error standard deviation of analysed_sst
Sea ice concentration
Daily optimum interpolation(OI) SST: AVHRR only
ECCO-JPL Adjoint Assimilation (1997 - 2000)
ECHAM surface stresses
Edit2 climatology of surface marine observations
Esbensen-Kushnir heat budget climatology
GEDEX: ISCCP-C2 Monthly Mean Cloud Product
Global Ocean Heat Flux and Wind Stress from Oregon State University Climate
GODAS: Global Ocean Data Assimilation System (2007)
straints that appear to the left and click
tton to automatically update plots as you
Done

LAS Data Gallery - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://porter.pmel.noaa.gov:8920/baker/getUI.do

Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo

PMEL Remote Access Server - Home | LAS Data Gallery

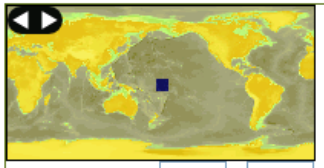
Live Access Server About LAS

Help
OPeNDAP (F-TDS) / THREDDS
Link to this page

LAS Data Gallery

Choose dataset | Update Plot | Set plot options | Animate | Compare | Google Earth | Show Values | Export to Desktop Application | Save As ...

by Dataset Name / Daily optimum interpolation(OI) SST: AMSR+AVHRR — Daily sea surface temperature



Latitude range -89.875 : 89.875

Longitude range 0.125 : 359.87

Reset Map

MAPS
- (•) Latitude-Longitude

LINE PLOTS
- ( ) Time series
- ( ) Longitude
- ( ) Latitude

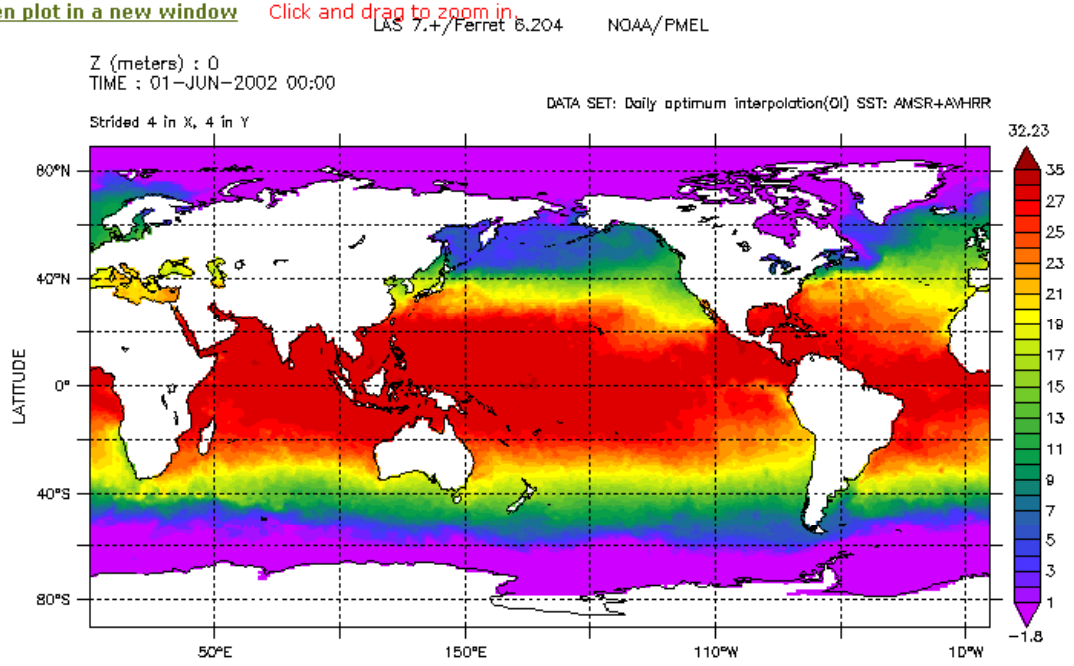
HOFMULLER PLOTS
- ( ) Longitude-time
- ( ) Latitude-time

Date : Jun 01 2002

Depth (meters) : 0

Apply analysis

Open plot in a new window Click and drag to zoom in



Transferring data from porter.pmel.noaa.gov...

LAS Data Gallery - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://porter.pmel.noaa.gov:8920/baker/getUI.do

Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo

PMEL Remote Access Server - Home | LAS Data Gallery

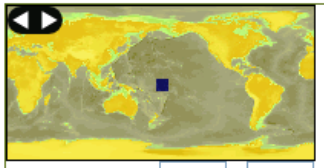
Live Access Server About LAS

Help
OPeNDAP (F-TDS) / THREDDS
Link to this page

LAS Data Gallery

Choose dataset | Update Plot | Set plot options | Animate | Compare | Google Earth | Show Values | Export to Desktop Application | Save As ...

by Dataset Name / Daily optimum interpolation(OI) SST: AMSR+AVHRR — Daily sea surface temperature



Latitude range -89.875 : 89.875

Longitude range 0.125 : 359.87

Reset Map

MAPS

- (•) Latitude-Longitude

LINE PLOTS

- ( ) Time series
- ( ) Longitude
- ( ) Latitude

HOFMULLER PLOTS

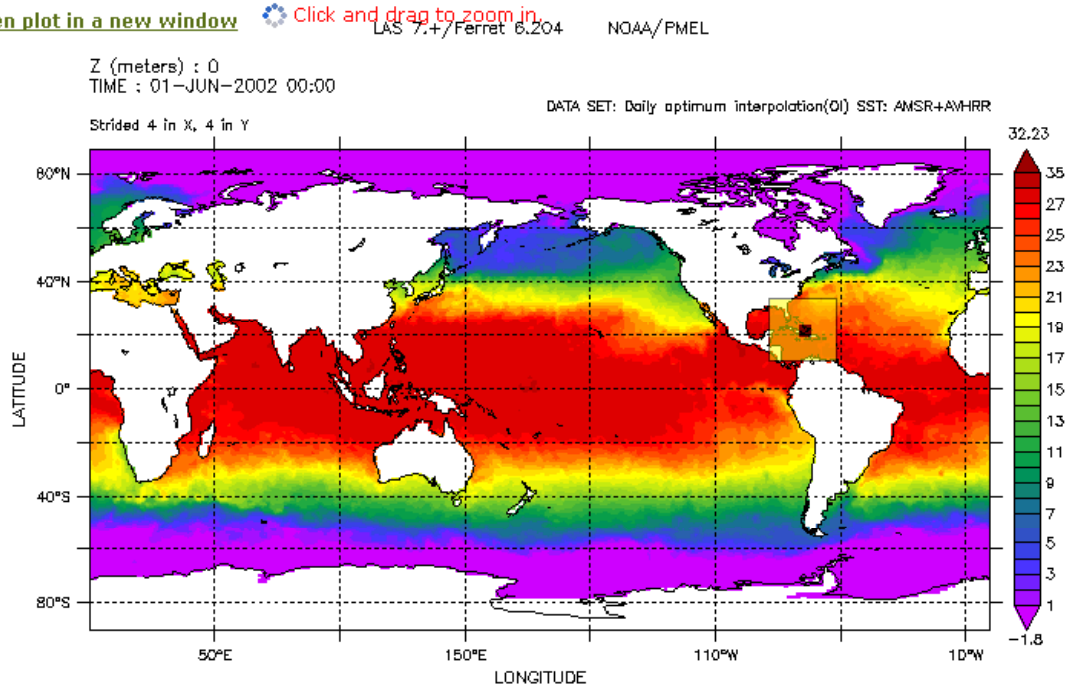
- ( ) Longitude-time
- ( ) Latitude-time

Date : Jun 01 2002

Depth (meters) : 0

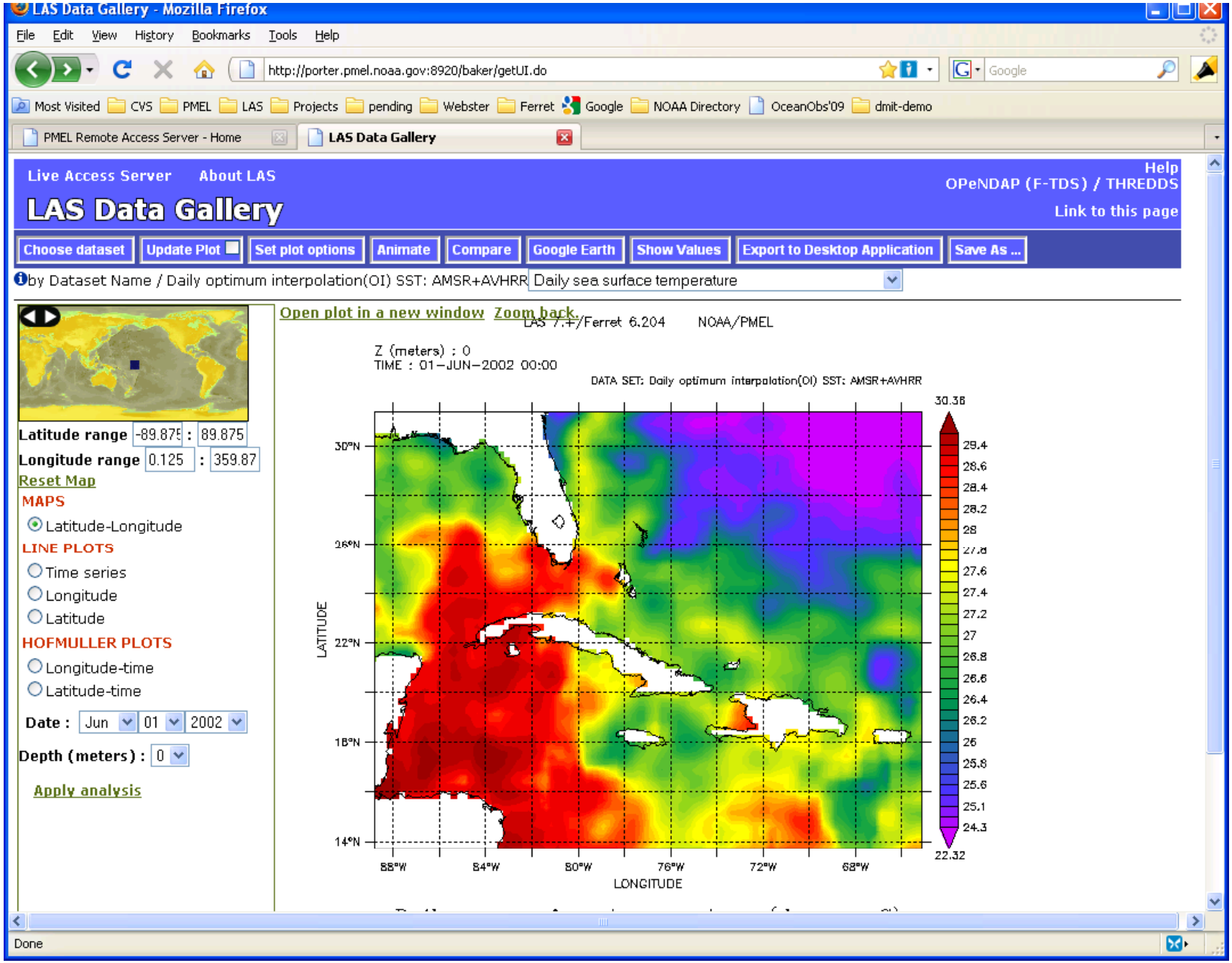
Apply analysis

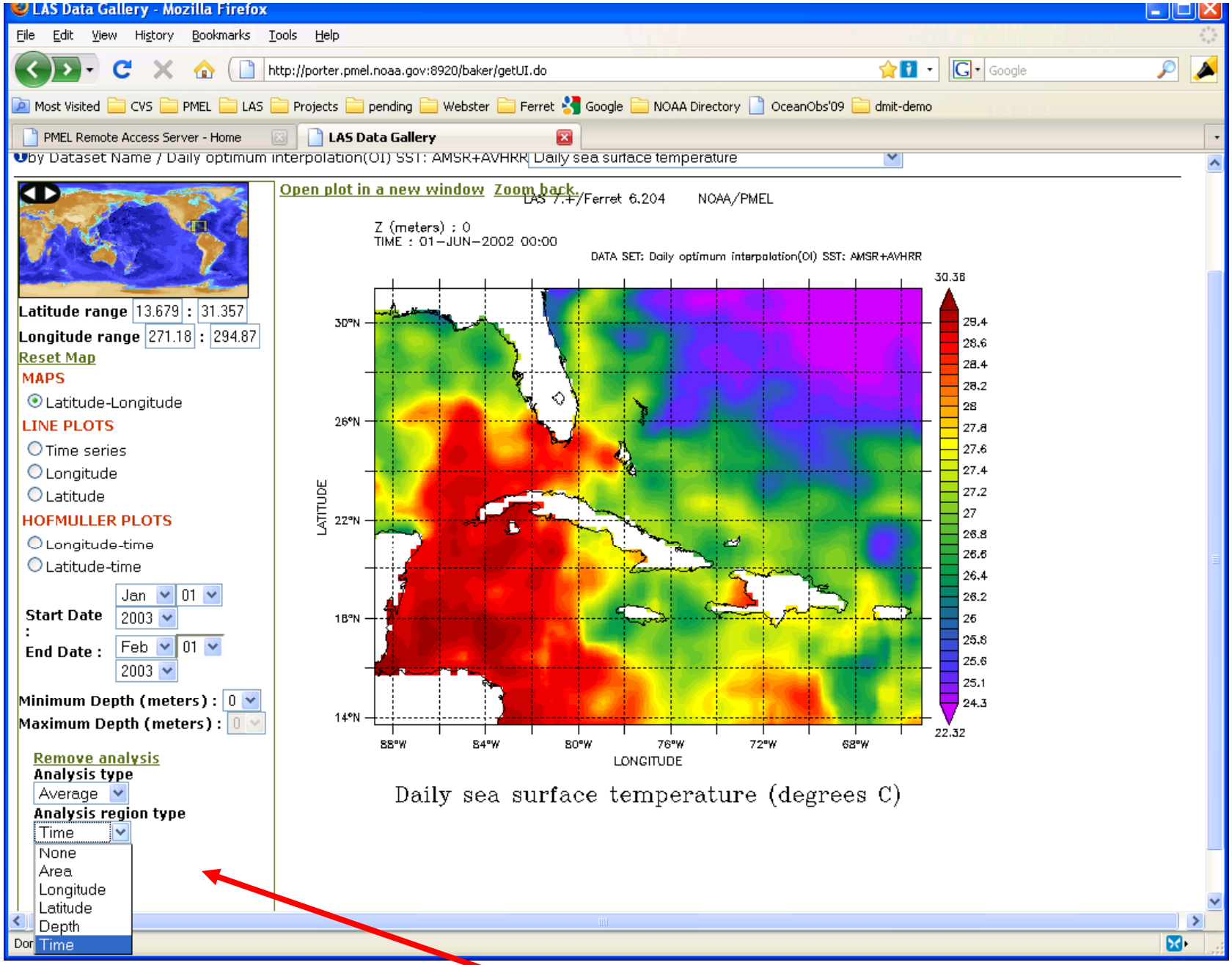
Open plot in a new window — Click and drag to zoom in



Daily sea surface temperature (degrees C)

Done


LAS Data Gallery - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/getUI.do
Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo
PMEL Remote Access Server - Home
LAS Data Gallery
Live Access Server
About LAS
Help
OPeNDAP (F-TDS) / THREDDS
Link to this page
LAS Data Gallery
Choose dataset
Update Plot
Set plot options
Animate
Compare
Google Earth
Show Values
Export to Desktop Application
Save As ...
by Dataset Name / Daily optimum interpolation(OI) SST: AMSR+AVHRR
Daily sea surface temperature
Latitude range -89.875 : 89.875
Longitude range 0.125 : 359.87
Reset Map
MAPS
Latitude-Longitude
LINE PLOTS
Time series
Longitude
Latitude
HOFMULLER PLOTS
Longitude-time
Latitude-time
Date : Jun 01 2002
Depth (meters) : 0
Apply analysis
Open plot in a new window
Zoom back
LAS 7.+/Ferret 6.204
NOAA/PMEL
Z (meters) : 0
TIME : 01-JUN-2002 00:00
DATA SET: Daily optimum interpolation(OI) SST: AMSR+AVHRR
30.36
29.4
28.6
28.4
28.2
28
27.6
27.4
27.2
27
26.8
26.6
26.4
26.2
26
25.8
25.6
25.1
24.3
22.32
30°N
26°N
22°N
18°N
14°N
LATITUDE
88°W
84°W
80°W
76°W
72°W
68°W
LONGITUDE
Done


LAS Data Gallery - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/getUI.do
Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo
PMEL Remote Access Server - Home
LAS Data Gallery
by Dataset Name / Daily optimum interpolation(OI) SST: AMSR+AVHRR
Daily sea surface temperature
Open plot in a new window
Zoom back
LAS 7.+/Ferret 6.204
NOAA/PMEL
Z (meters) : 0
TIME : 01-JUN-2002 00:00
DATA SET: Daily optimum interpolation(OI) SST: AMSR+AVHRR
30.36
29.4
28.6
28.4
28.2
28
27.8
27.6
27.4
27.2
27
26.8
26.6
26.4
26.2
26
25.8
25.6
25.1
24.3
22.32
30°N
26°N
22°N
18°N
14°N
LATITUDE
88°W
84°W
80°W
76°W
72°W
68°W
LONGITUDE
Daily sea surface temperature (degrees C)
Latitude range 13.679 : 31.357
Longitude range 271.18 : 294.87
Reset Map
MAPS
Latitude-Longitude
LINE PLOTS
Time series
Longitude
Latitude
HOFMULLER PLOTS
Longitude-time
Latitude-time
Start Date : Jan 01 2003
End Date : Feb 01 2003
Minimum Depth (meters) : 0
Maximum Depth (meters) : 0
Remove analysis
Analysis type
Average
Analysis region type
Time
None
Area
Longitude
Latitude
Depth
Time

LAS Data Gallery - Mozilla Firefox

File Edit View History Bookmarks Tools Help

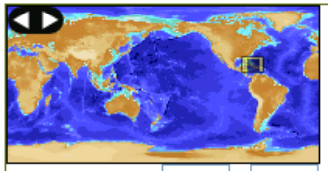
http://porter.pmel.noaa.gov:8920/baker/getUI.do

Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo

PMEL Remote Access Server - Home | LAS Data Gallery

Choose dataset | Update Plot | Set plot options | Compare | Google Earth | Show Values | Export to Desktop Application | Save As ...

by Dataset Name / Daily optimum interpolation(OI) SST: AMSR+AVHRR | Daily sea surface temperature



Latitude range 13.679 : 31.357

Longitude range 271.18 : 294.87

Reset Map

MAPS

- (•) Latitude-Longitude

LINE PLOTS

- ( ) Time series
- ( ) Longitude
- ( ) Latitude

HOFMULLER PLOTS

- ( ) Longitude-time
- ( ) Latitude-time

Start Date : Jan 01 2003

End Date : Feb 01 2003

Minimum Depth (meters) : 0

Maximum Depth (meters) : 0

Remove analysis

Analysis type: Average

Analysis region type: Time

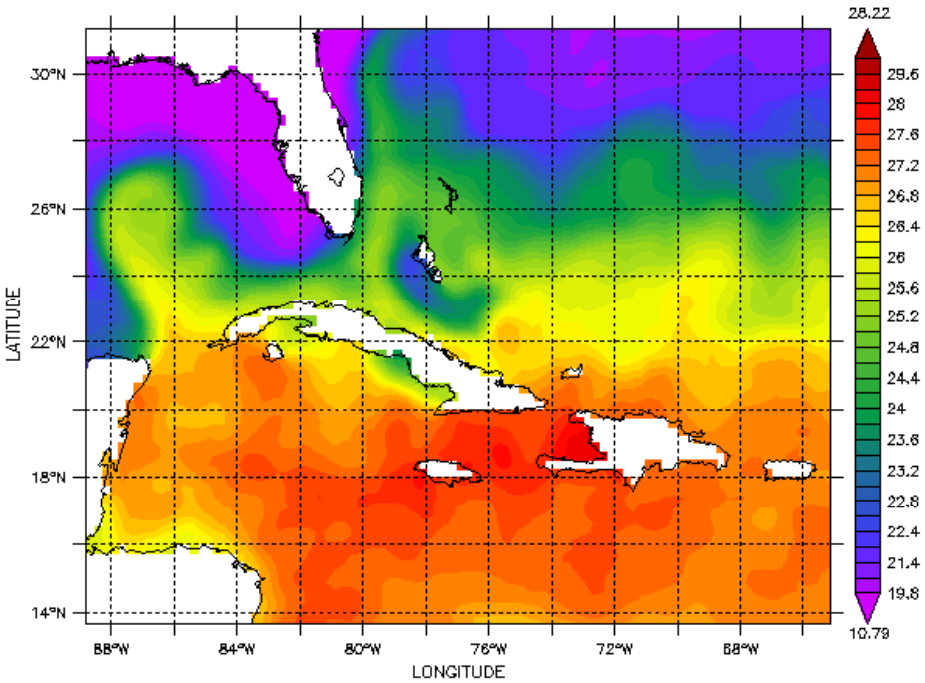
Open plot in a new window Click and drag to zoom in.

LAS 7.+/Ferret 6.204 NOAA/PMEL

Z (meters) : 0

TIME : 01-JAN-2003 00:00 to 01-FEB-2003 00:00

DATA SET: Daily optimum Interpolation(OI) SST: AMSR+AVHRR



Average Daily sea surface temperature [t= 01-Jan-2003 : 01-Feb-2003 @ave] (degrees C)

Done

LAS Data Gallery - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://porter.pmel.noaa.gov:8920/baker/getUI.do

Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo

PMEL Remote Access Server - Home | LAS Data Gallery

Live Access Server About LAS

Help

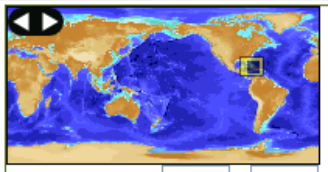
OPeNDAP (F-TDS) / THREDDS

Link to this page

LAS Data Gallery

Choose dataset | Update Plot | Set plot options | Animate | Compare | Google Earth | Show Values | Export to Desktop Application | Save As ...

by Dataset Name / Daily optimum interpolation(OI) SST: AMSR+AVHRR Daily sea surface temperature



Latitude range 12.679 : 32.357

Longitude range 270.18 : 295.87

Reset Map

MAPS

- (•) Latitude-Longitude

LINE PLOTS

- ( ) Time series
- ( ) Longitude
- ( ) Latitude

HOFMULLER PLOTS

- ( ) Longitude-time
- ( ) Latitude-time

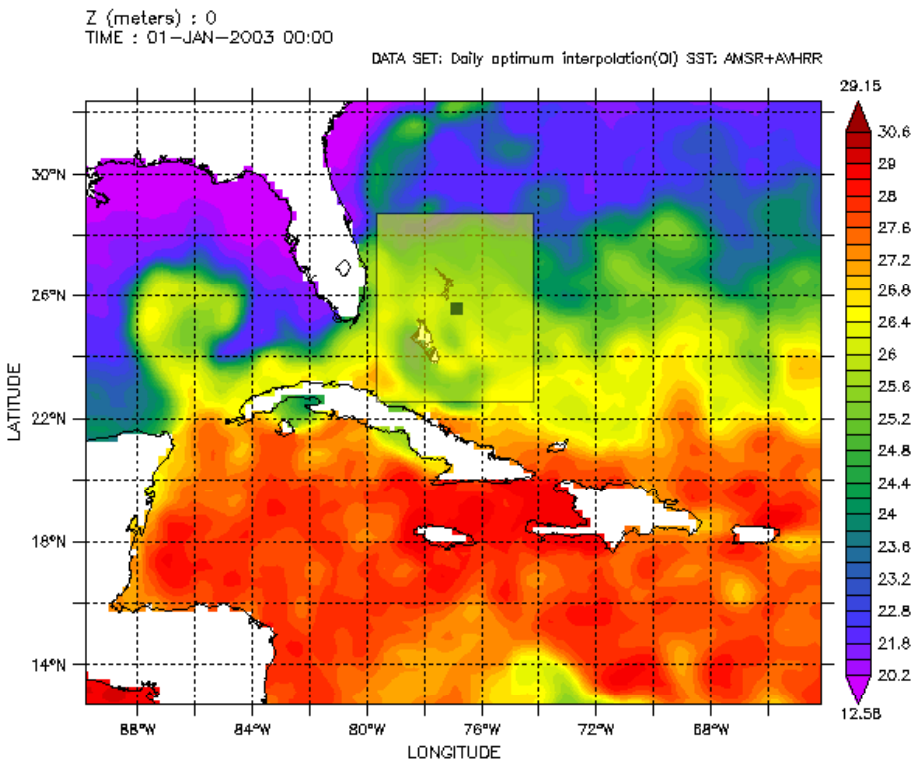
Date : Jan 01 2003

Depth (meters) : 0

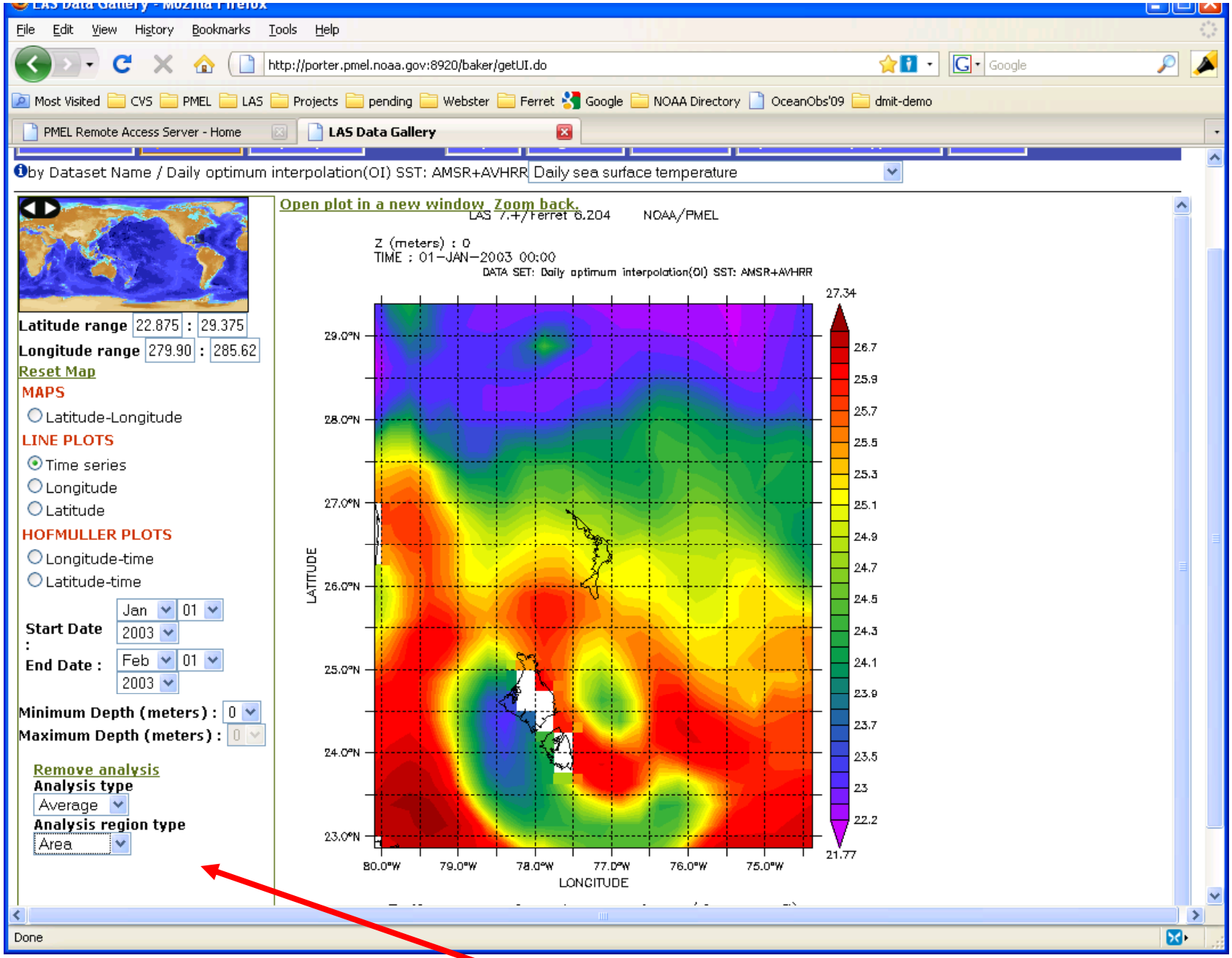
Apply analysis

Open plot in a new window Click and drag to zoom in

LAS 7.1/Ferret 6.204 NOAA/PMEL



Done


File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/getUI.do
Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo
PMEL Remote Access Server - Home
LAS Data Gallery
by Dataset Name / Daily optimum interpolation(OI) SST: AMSR+AVHRR
Daily sea surface temperature
Open plot in a new window Zoom back.
LAS 7.4/Ferret 6.204 NOAA/PMEL
Z (meters) : 0
TIME : 01-JAN-2003 00:00
DATA SET: Daily optimum interpolation(OI) SST: AMSR+AVHRR
Latitude range 22.875 : 29.375
Longitude range 279.90 : 285.62
Reset Map
MAPS
Latitude-Longitude
LINE PLOTS
Time series
Longitude
Latitude
HOFMULLER PLOTS
Longitude-time
Latitude-time
Start Date : Jan 01 2003
End Date : Feb 01 2003
Minimum Depth (meters) : 0
Maximum Depth (meters) : 0
Remove analysis
Analysis type
Average
Analysis region type
Area
29.0°N
28.0°N
27.0°N
26.0°N
25.0°N
24.0°N
23.0°N
LATITUDE
80.0°W
79.0°W
78.0°W
77.0°W
76.0°W
75.0°W
LONGITUDE
27.34
26.7
25.9
25.7
25.5
25.3
25.1
24.9
24.7
24.5
24.3
24.1
23.9
23.7
23.5
23
22.2
21.77
Done

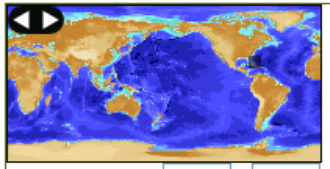
LAS Data Gallery - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://porter.pmel.noaa.gov:8920/baker/getUI.do

Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo

PMEL Remote Access Server - Home | LAS Data Gallery



Latitude range 22.875 : 29.375

Longitude range 279.90 : 285.62

Reset Map

MAPS

- Latitude-Longitude

LINE PLOTS

- Time series
- Longitude
- Latitude

HOFMULLER PLOTS

- Longitude-time
- Latitude-time

Start Date : Jan 01 2003

End Date : Feb 01 2003

Minimum Depth (meters) : 0

Maximum Depth (meters) : 0

Remove analysis

Analysis type

Average

Analysis region type

Area

LAS 7.+/Ferret 6.204 NOAA/PMEL

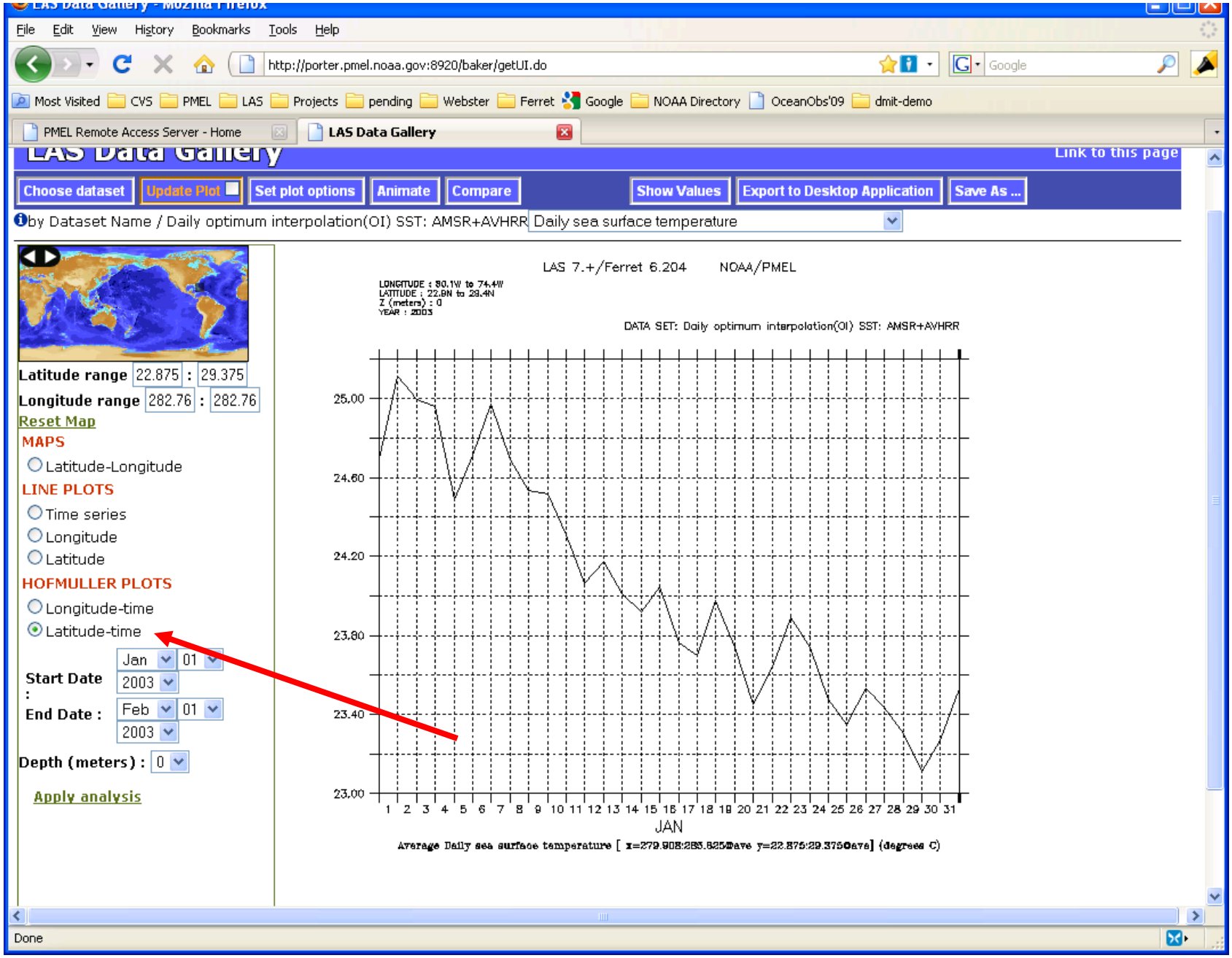
LONGITUDE : 80.1W to 74.4W
LATITUDE : 22.9N to 29.4N
Z (meters) : 0
YEAR : 2003

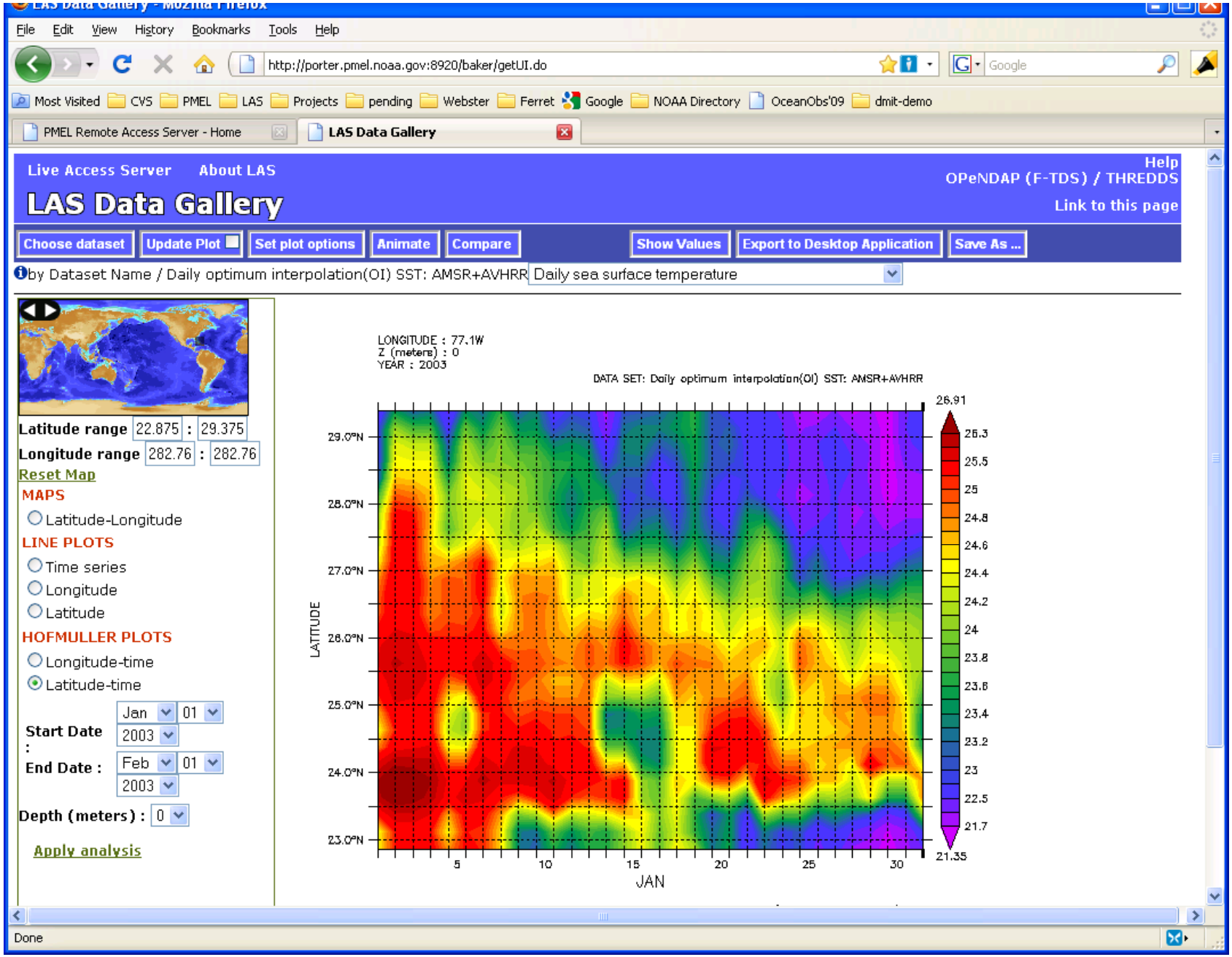
DATA SET: Daily optimum interpolation(OI) SST: AMSR+AVHRR

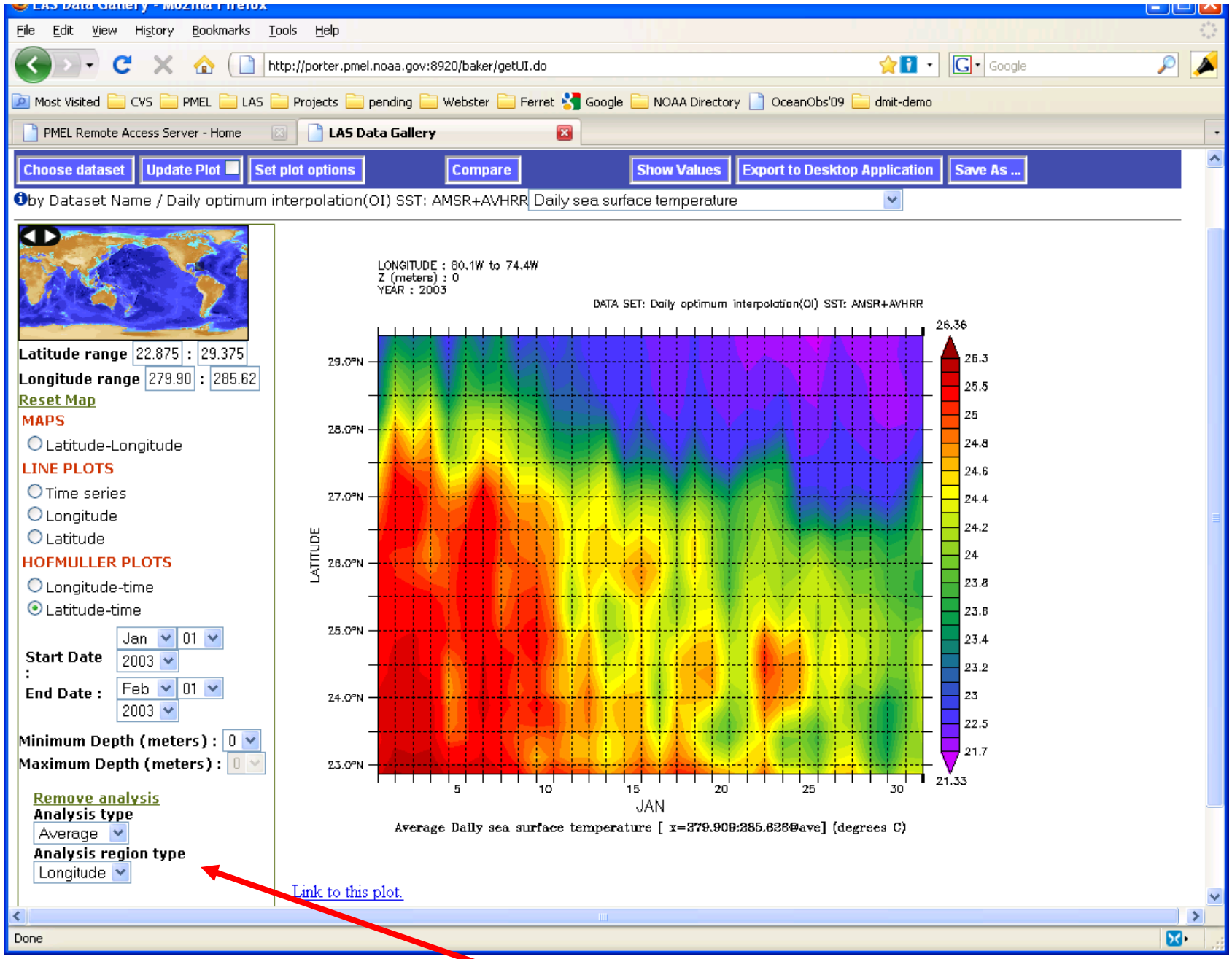
Average Daily sea surface temperature [x=279.90E:285.62Eave y=22.875:29.375Nave] (degrees C)

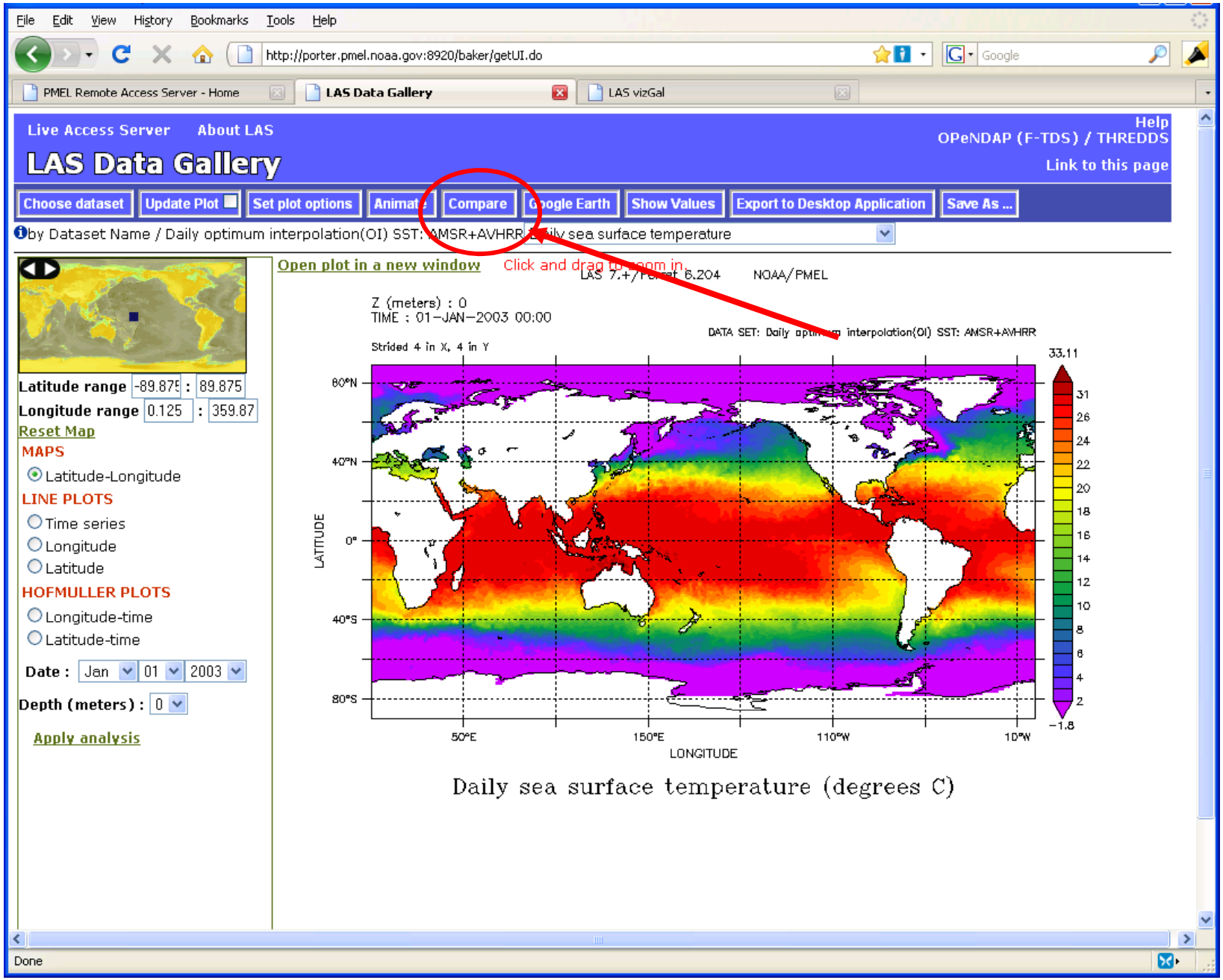
Link to this plot.

Done


LAS Data Gallery - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/getUI.do
Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo
PMEL Remote Access Server - Home
LAS Data Gallery
LAS Data Gallery
Link to this page
Choose dataset
Update Plot
Set plot options
Animate
Compare
Show Values
Export to Desktop Application
Save As ...
by Dataset Name / Daily optimum interpolation(OI) SST: AMSR+AVHRR
Daily sea surface temperature
Latitude range 22.875 : 29.375
Longitude range 282.76 : 282.76
Reset Map
MAPS
Latitude-Longitude
LINE PLOTS
Time series
Longitude
Latitude
HOFMULLER PLOTS
Longitude-time
Latitude-time
Start Date : Jan 01 2003
End Date : Feb 01 2003
Depth (meters) : 0
Apply analysis
LAS 7.+/Ferret 6.204 NOAA/PMEL
LONGITUDE : 80.1W to 74.4W
LATITUDE : 22.8N to 29.4N
Z (meters) : 0
YEAR : 2003
DATA SET: Daily optimum interpolation(OI) SST: AMSR+AVHRR
25.00
24.60
24.20
23.80
23.40
23.00
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
JAN
Average Daily sea surface temperature [x=279.908:285.825@ave y=22.875:29.375@ave] (degrees C)
Done


File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/getUI.do
Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo
PMEL Remote Access Server - Home
LAS Data Gallery
Live Access Server About LAS
Help
OPeNDAP (F-TDS) / THREDDS
Link to this page
LAS Data Gallery
Choose dataset
Update Plot
Set plot options
Animate
Compare
Show Values
Export to Desktop Application
Save As ...
by Dataset Name / Daily optimum interpolation(OI) SST: AMSR+AVHRR
Daily sea surface temperature
Latitude range 22.875 : 29.375
Longitude range 282.76 : 282.76
Reset Map
MAPS
Latitude-Longitude
LINE PLOTS
Time series
Longitude
Latitude
HOFMULLER PLOTS
Longitude-time
Latitude-time
Start Date : Jan 01 2003
End Date : Feb 01 2003
Depth (meters) : 0
Apply analysis
LONGITUDE : 77.1W
Z (meters) : 0
YEAR : 2003
DATA SET: Daily optimum interpolation(OI) SST: AMSR+AVHRR
LATITUDE
29.0°N
28.0°N
27.0°N
26.0°N
25.0°N
24.0°N
23.0°N
5
10
15
20
25
30
JAN
26.91
26.3
25.5
25
24.8
24.6
24.4
24.2
24
23.8
23.6
23.4
23.2
23
22.5
21.7
21.35
Done

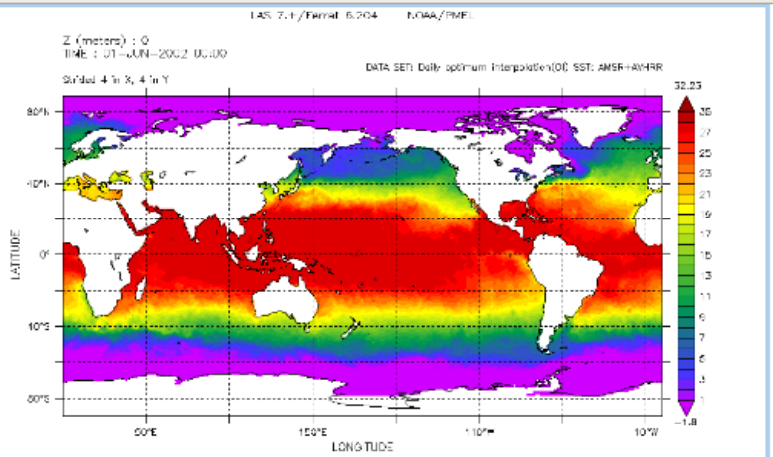

LAS Data Gallery - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/getUI.do
Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo
PMEL Remote Access Server - Home
LAS Data Gallery
Choose dataset
Update Plot
Set plot options
Compare
Show Values
Export to Desktop Application
Save As ...
by Dataset Name / Daily optimum interpolation(OI) SST: AMSR+AVHRR
Daily sea surface temperature
Latitude range 22.875 : 29.375
Longitude range 279.90 : 285.62
Reset Map
MAPS
Latitude-Longitude
LINE PLOTS
Time series
Longitude
Latitude
HOFMULLER PLOTS
Longitude-time
Latitude-time
Start Date : Jan 01 2003
End Date : Feb 01 2003
Minimum Depth (meters) : 0
Maximum Depth (meters) : 0
Remove analysis
Analysis type
Average
Analysis region type
Longitude
LONGITUDE : 80.1W to 74.4W
Z (meters) : 0
YEAR : 2003
DATA SET: Daily optimum interpolation(OI) SST: AMSR+AVHRR
29.0°N
28.0°N
27.0°N
26.0°N
25.0°N
24.0°N
23.0°N
LATITUDE
5
10
15
20
25
30
JAN
26.36
25.3
25.5
25
24.8
24.6
24.4
24.2
24
23.8
23.6
23.4
23.2
23
22.5
21.7
21.33
Average Daily sea surface temperature [x=279.909:285.628@ave] (degrees C)
Link to this plot.
Done


File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/getUI.do
PMEL Remote Access Server - Home
LAS Data Gallery
LAS vizGal
Live Access Server
About LAS
LAS Data Gallery
Help
OPeNDAP (F-TDS) / THREDDS
Link to this page
Choose dataset
Update Plot
Set plot options
Animate
Compare
Google Earth
Show Values
Export to Desktop Application
Save As ...
by Dataset Name / Daily optimum interpolation(OI) SST: AMSR+AVHRR
Open plot in a new window
Click and drag to zoom in
NOAA/PMEL
Z (meters) : 0
TIME : 01-JAN-2003 00:00
DATA SET: Daily optimum interpolation(OI) SST: AMSR+AVHRR
Strided 4 in X, 4 in Y
33.11
31
26
24
22
20
18
16
14
12
10
8
6
4
2
-1.8
80°N
40°N
0°
40°S
80°S
LATITUDE
50°E
150°E
110°W
10°W
LONGITUDE
Daily sea surface temperature (degrees C)
Latitude range -89.875 : 89.875
Longitude range 0.125 : 359.87
Reset Map
MAPS
Latitude-Longitude
LINE PLOTS
Time series
Longitude
Latitude
HOFMULLER PLOTS
Longitude-time
Latitude-time
Date : Jan 01 2003
Depth (meters) : 0
Apply analysis
Done

File Edit View History Bookmarks Tools Help

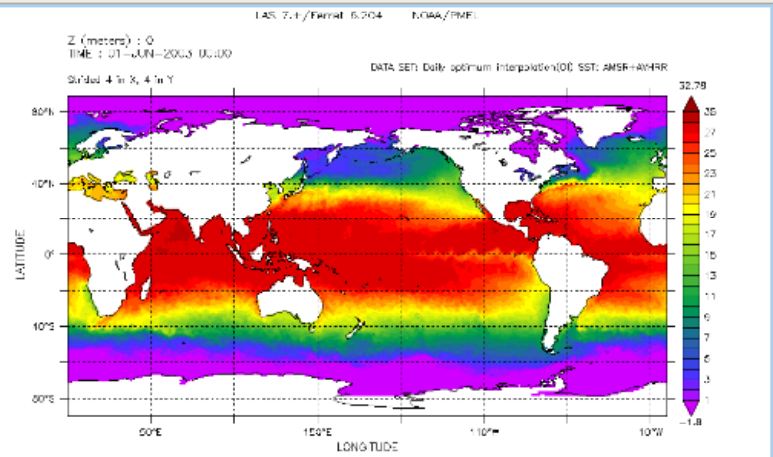
http://porter.pmel.noaa.gov:8920/baker/VizGal/VizGal.html?dsid=id-59f4b578f98vid=sst-id-123456789&opid=

PMEL Remote Access Server - Home | LAS Data Gallery | LAS vizGal



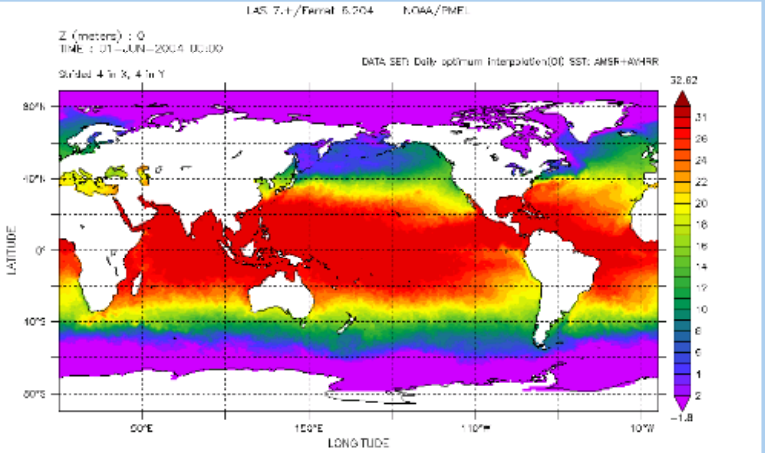
Daily sea surface temperature (degrees C)

Start date: 2002 Jun 01



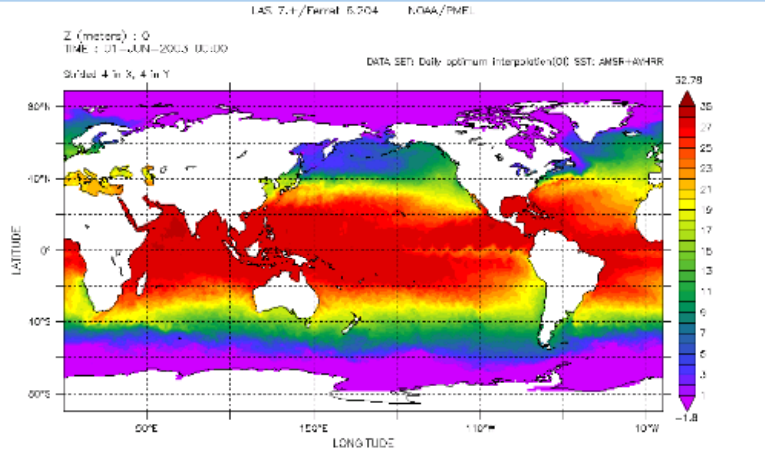
Daily sea surface temperature (degrees C)

Start date: 2003 Jun 01



Daily sea surface temperature (degrees C)

Start date: 2004 Jun 01



Daily sea surface temperature (degrees C)

Start date: 2005 Jun 01

Done

File Edit View History Bookmarks Tools Help

http://porter.pmel.noaa.gov:8920/baker/VizGal/VizGal.html?dsid=id-59f4b578f9&vid=sst-id-123456789&opid=

PMEL Remote Access Server - Home | LAS Data Gallery | LAS vizGal

Difference Mode

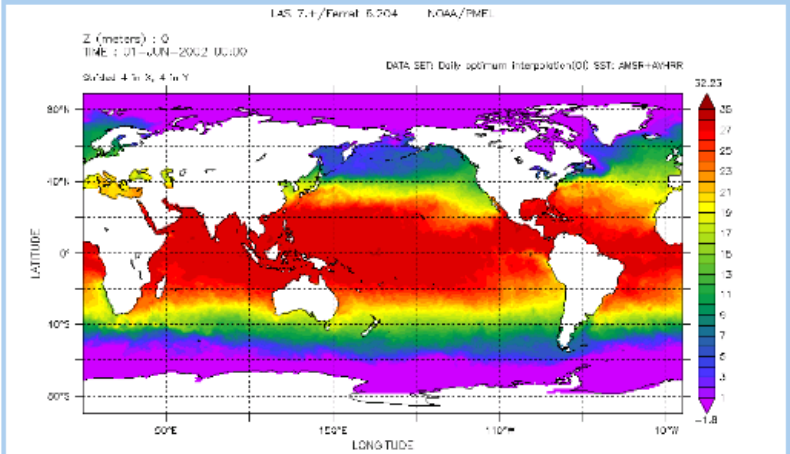
Z (meters): 0

Select Axis to Vary in Panels

Start date: 2003 Jun 01

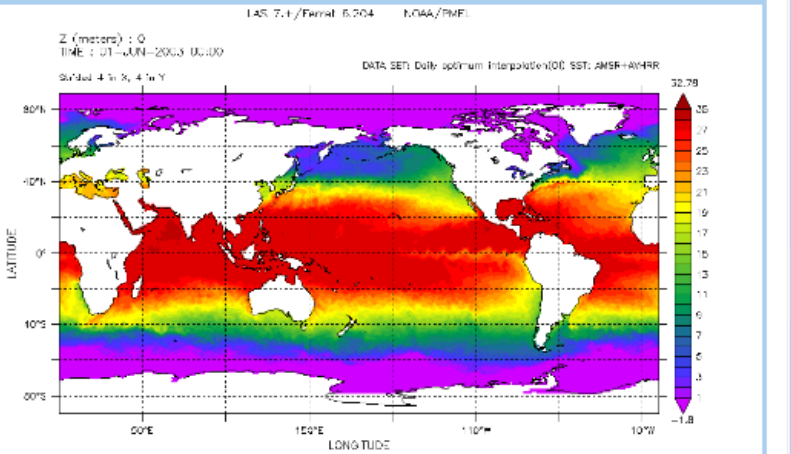
Auto Set Color Fill Levels for Gallery

Image zoom: Auto



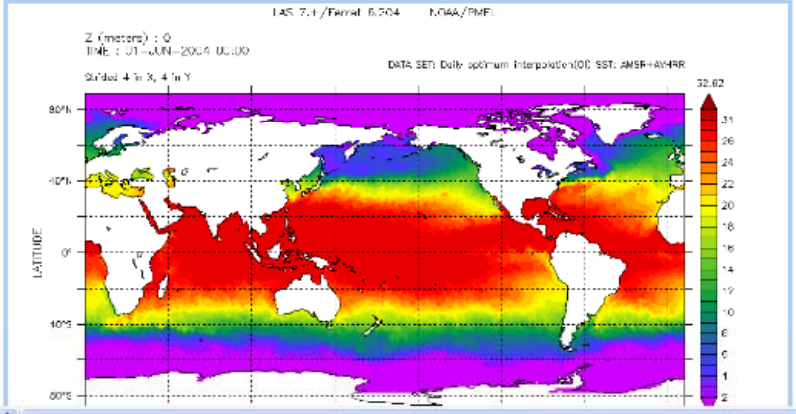
Daily sea surface temperature (degrees C)

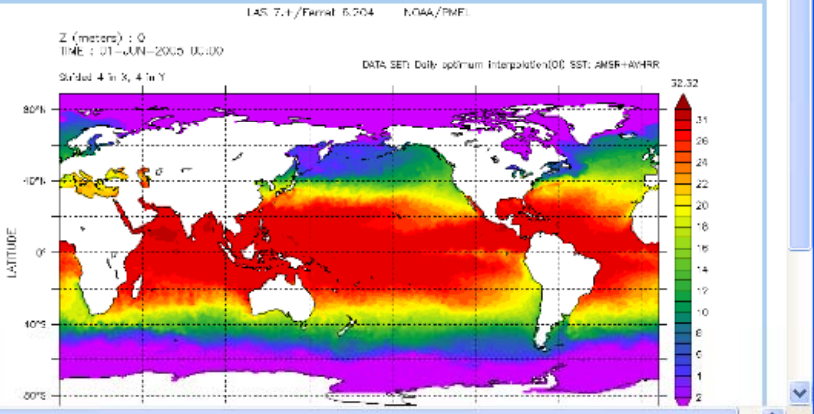
Start date: 2002 Jun 01



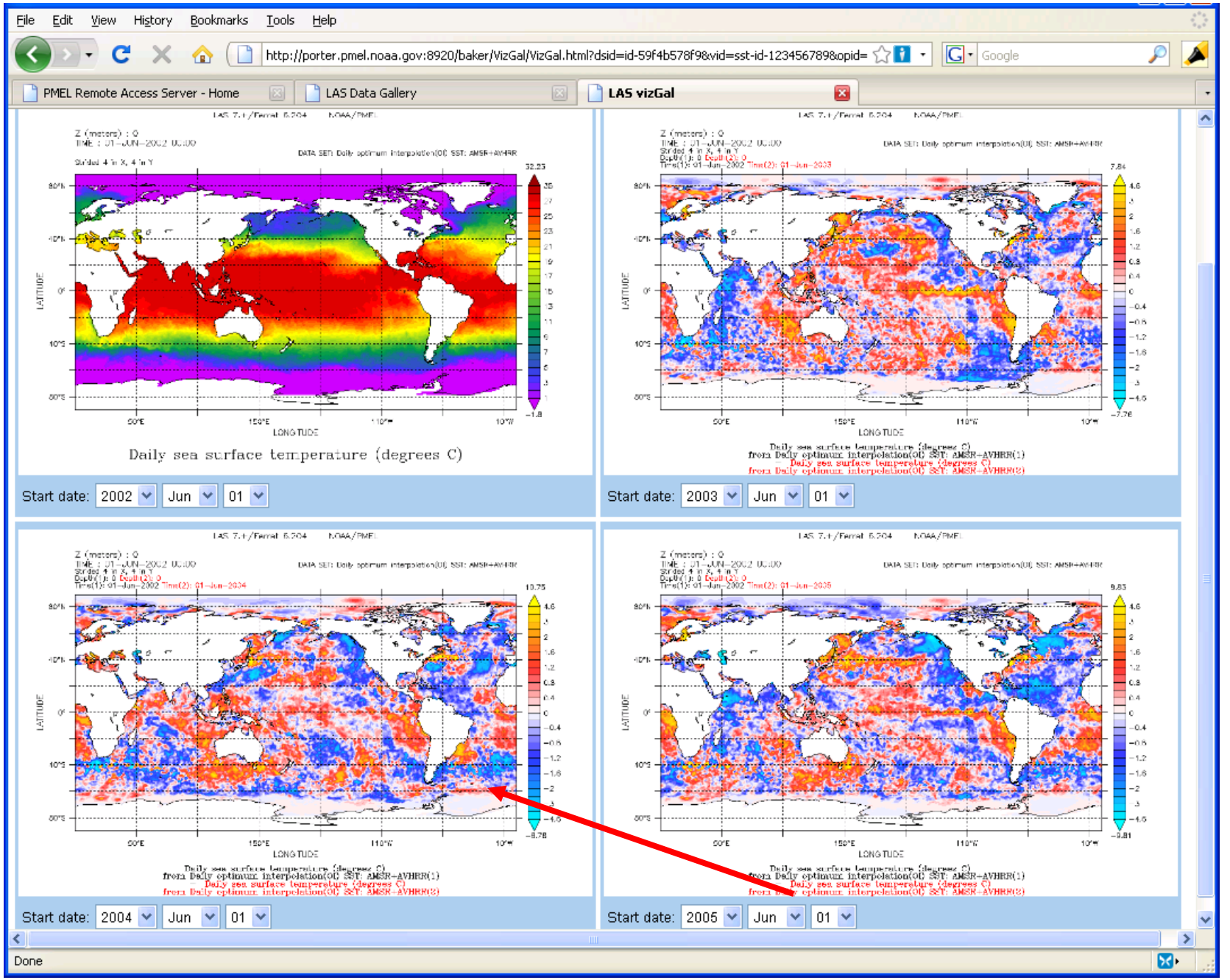
Daily sea surface temperature (degrees C)

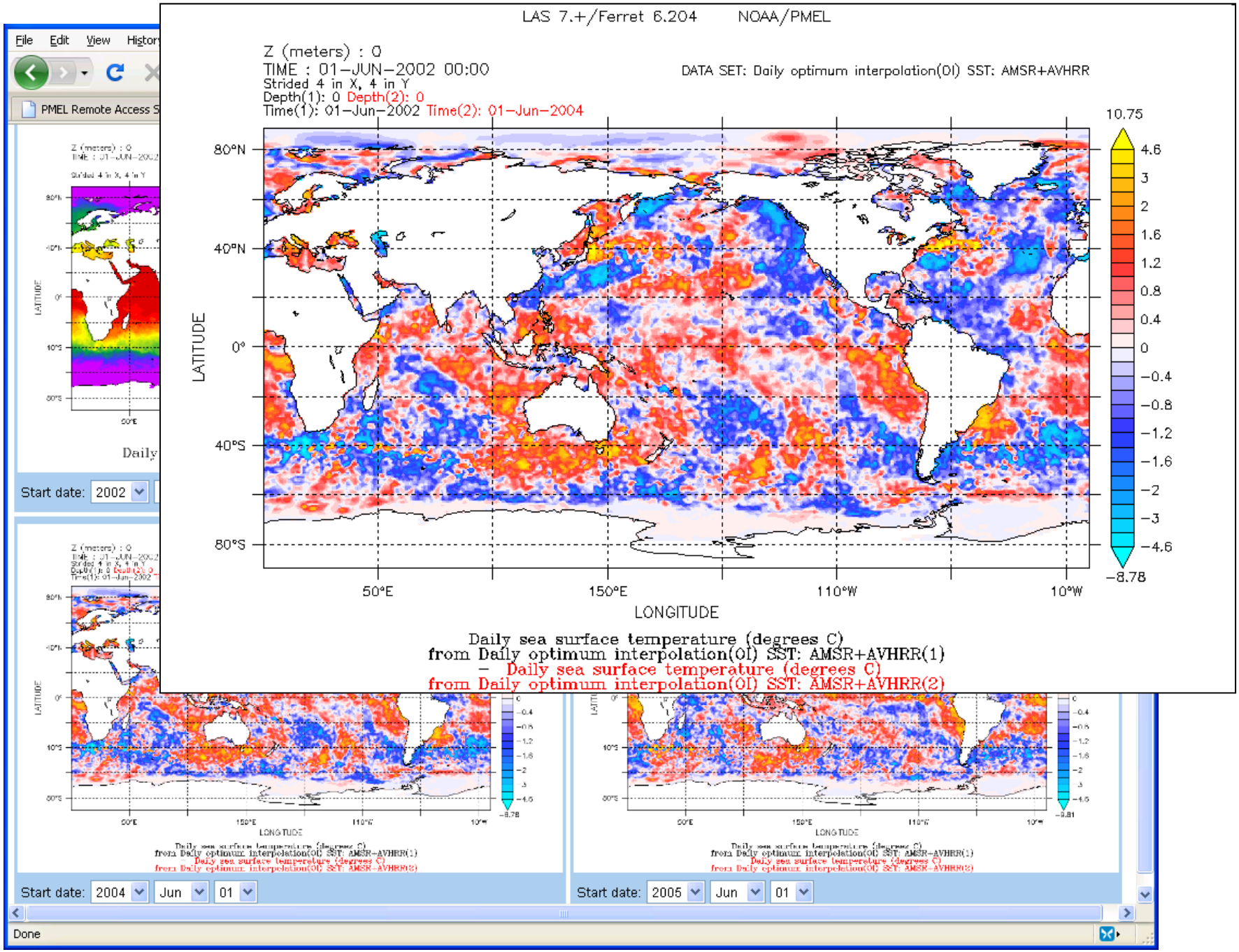
Start date: 2003 Jun 01





Done


File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/VizGal/VizGal.html?dsid=id-59f4b578f9&vid=sst-id-123456789&opid=
PMEL Remote Access Server - Home
LAS Data Gallery
LAS vizGal
Daily sea surface temperature (degrees C)
Start date: 2002 Jun 01
Start date: 2003 Jun 01
Start date: 2004 Jun 01
Start date: 2005 Jun 01
LONGITUDE
LATITUDE
Done


File Edit View History
PMEL Remote Access S
Start date: 2002
Start date: 2004 Jun 01
Start date: 2005 Jun 01
Done
LAS 7.+/Ferret 6.204 NOAA/PMEL
Z (meters) : 0
TIME : 01-JUN-2002 00:00
Strided 4 in X, 4 in Y
Depth(1): 0 Depth(2): 0
Time(1): 01-Jun-2002 Time(2): 01-Jun-2004
DATA SET: Daily optimum interpolation(OI) SST: AMSR+AVHRR
10.75
4.6
3
2
1.6
1.2
0.8
0.4
0
-0.4
-0.8
-1.2
-1.6
-2
-3
-4.6
-8.78
80°N
40°N
0°
40°S
80°S
LATITUDE
50°E
150°E
110°W
10°W
LONGITUDE
Daily sea surface temperature (degrees C)
from Daily optimum interpolation(OI) SST: AMSR+AVHRR(1)
- Daily sea surface temperature (degrees C)
from Daily optimum interpolation(OI) SST: AMSR+AVHRR(2)

File Edit View History Bookmarks Tools Help

http://porter.pmel.noaa.gov:8920/baker/VizGal/VizGal.html?dsid=id-59f4b578f9&vid=sst-id-123456789&opid=

PMEL Remote Access Server - Home | LAS Data Gallery | LAS vizGal

Difference Mode | Z (meters): 0 | **Select Axis to Vary in Panels** | Start date: 2003 Jun 01 | **Auto Set Color Fill Levels for Gallery** | **Image zoom:** Auto

Gallery Settings

Apply

Data Set | Plot Options

Select region | Select | All

Set center | Reset

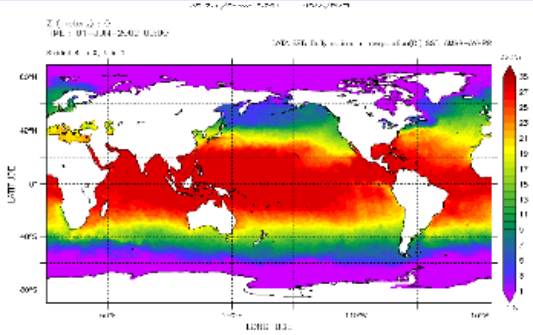
Lat: 89.88 N Lon: 0.13 W

89.88 S 0.13 E

Maps

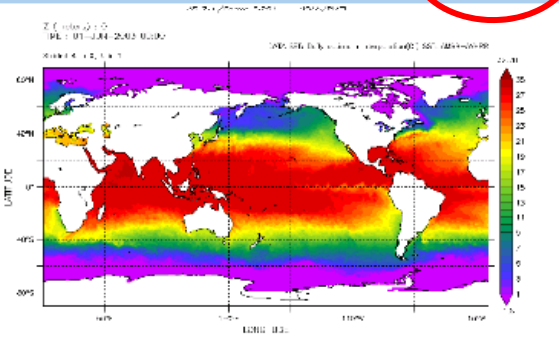
Latitude-Longitude

Daily optimum interpolation(OI) SST: AMSR+AVHRR: Daily sea surface temperature (See left)



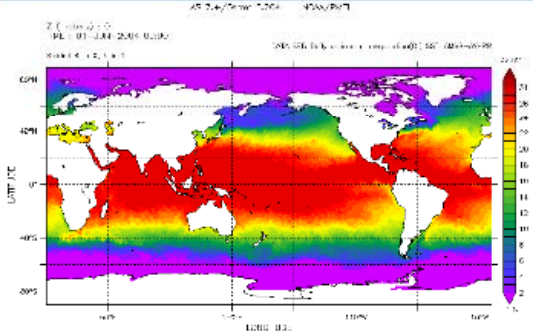
Start date: 2002 Jun 01

Daily optimum interpolation(OI) SST: AMSR+AVHRR: Daily sea surface temperature Settings



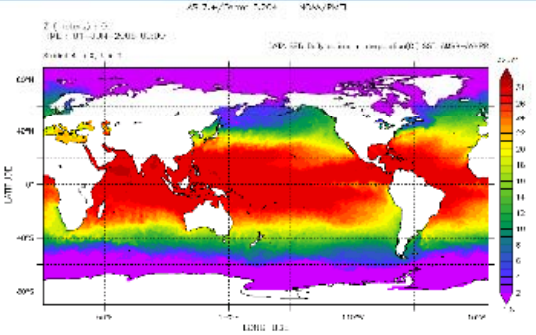
Start date: 2003 Jun 01

Daily optimum interpolation(OI) SST: AMSR+AVHRR: Daily sea surface temperature Settings



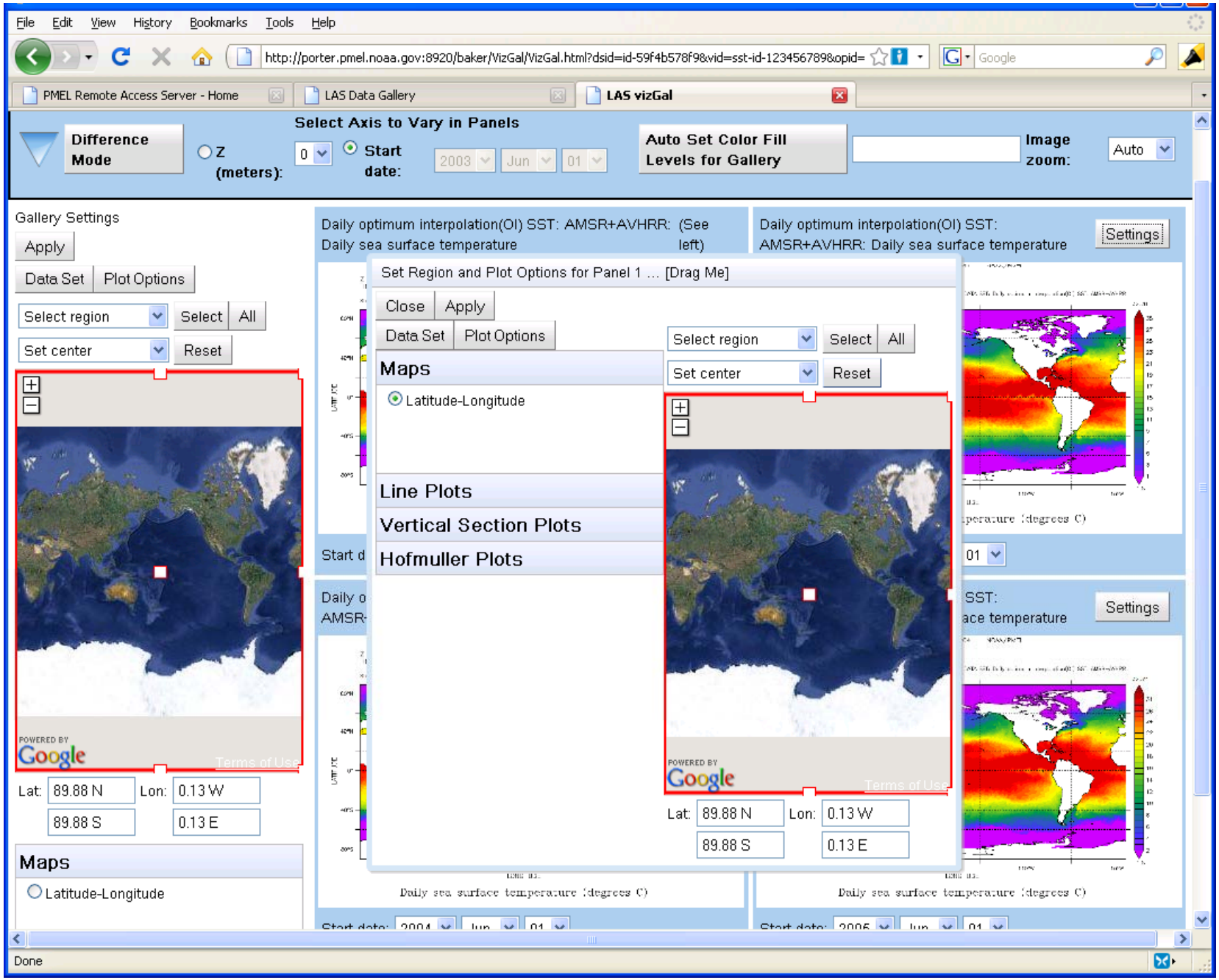
Start date: 2004 Jun 01

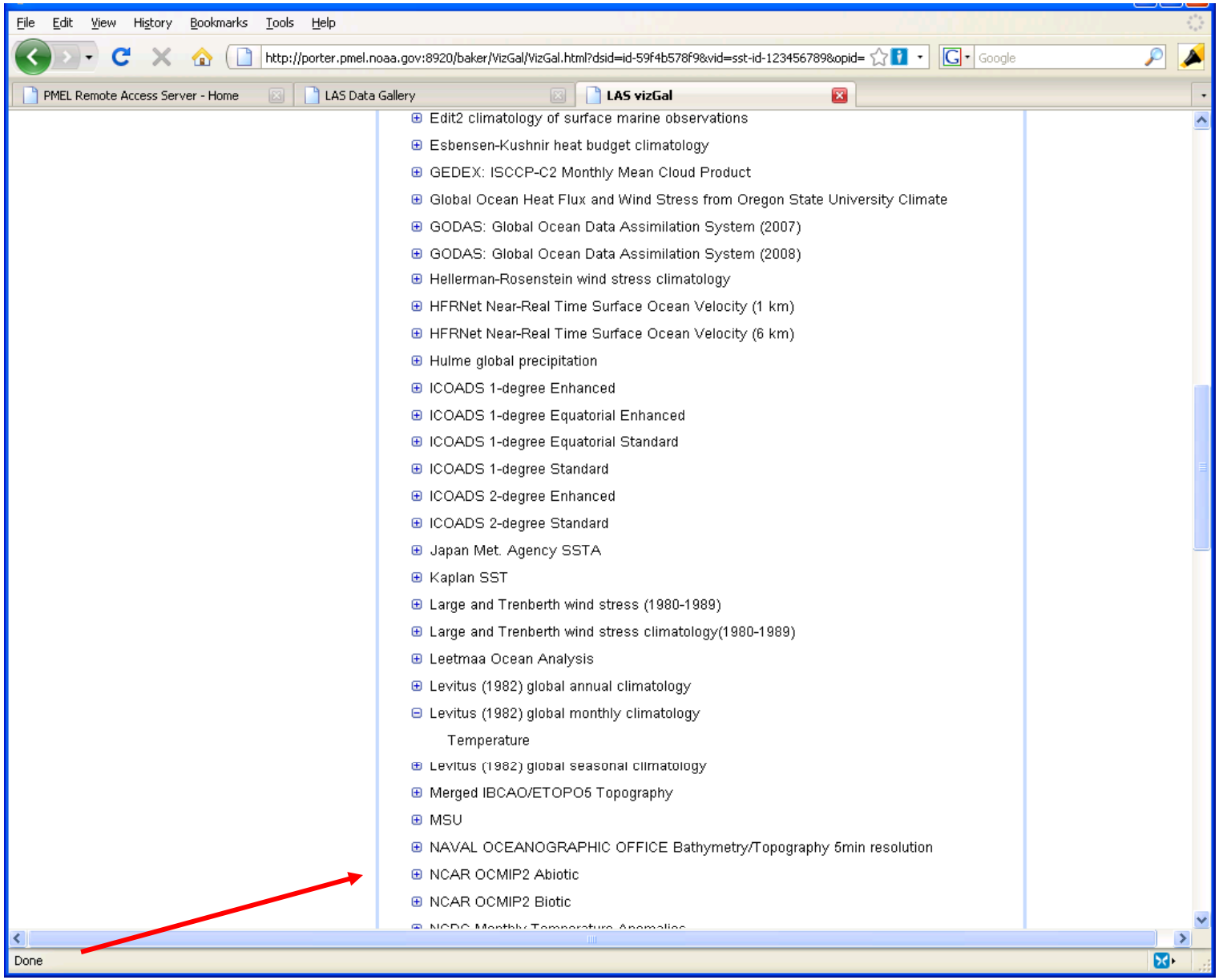
Daily optimum interpolation(OI) SST: AMSR+AVHRR: Daily sea surface temperature Settings

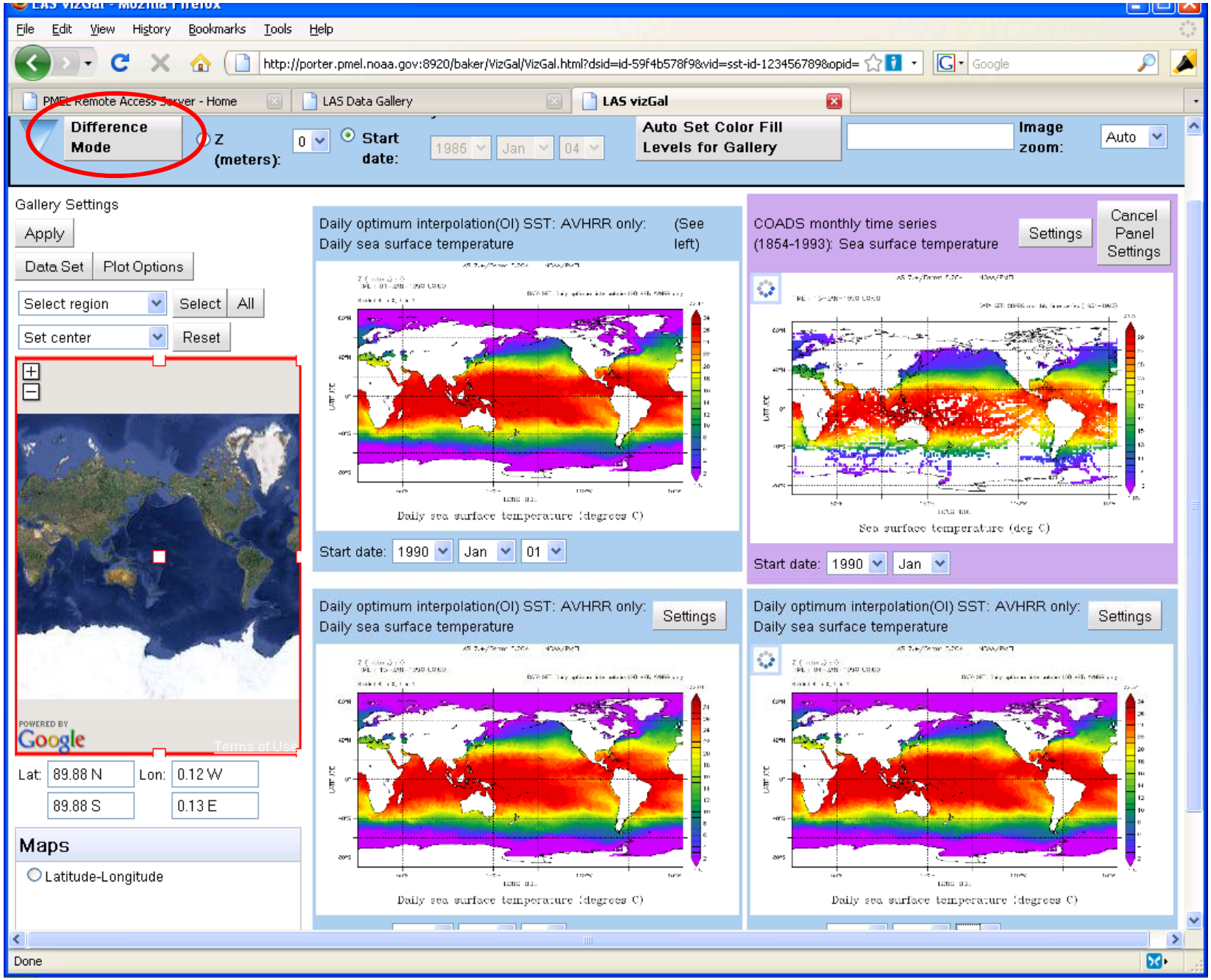


Start date: 2006 Jun 01

Done


File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/VizGal/VizGal.html?dsid=id-59f4b578f9&vid=sst-id-123456789&opid=
PMEL Remote Access Server - Home
LAS Data Gallery
LAS vizGal
Difference Mode
Z (meters):
Select Axis to Vary in Panels
Start date:
Auto Set Color Fill Levels for Gallery
Image zoom:
Auto
Gallery Settings
Apply
Data Set
Plot Options
Select region
Select
All
Set center
Reset
Maps
Latitude-Longitude
Lat: 89.88 N
89.88 S
Lon: 0.13 W
0.13 E
Daily optimum interpolation(OI) SST: AMSR+AVHRR: Daily sea surface temperature
(See left)
Settings
Set Region and Plot Options for Panel 1 ... [Drag Me]
Close
Apply
Line Plots
Vertical Section Plots
Hofmuller Plots
Daily sea surface temperature (degrees C)
Done


File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/VizGal/VizGal.html?dsid=id-59f4b578f9&vid=sst-id-123456789&opid=
Google
PMEL Remote Access Server - Home
LAS Data Gallery
LAS vizGal
Edit2 climatology of surface marine observations
Esbensen-Kushnir heat budget climatology
GEDEX: ISCCP-C2 Monthly Mean Cloud Product
Global Ocean Heat Flux and Wind Stress from Oregon State University Climate
GODAS: Global Ocean Data Assimilation System (2007)
GODAS: Global Ocean Data Assimilation System (2008)
Hellerman-Rosenstein wind stress climatology
HFRNet Near-Real Time Surface Ocean Velocity (1 km)
HFRNet Near-Real Time Surface Ocean Velocity (6 km)
Hulme global precipitation
ICOADS 1-degree Enhanced
ICOADS 1-degree Equatorial Enhanced
ICOADS 1-degree Equatorial Standard
ICOADS 1-degree Standard
ICOADS 2-degree Enhanced
ICOADS 2-degree Standard
Japan Met. Agency SSTA
Kaplan SST
Large and Trenberth wind stress (1980-1989)
Large and Trenberth wind stress climatology(1980-1989)
Leetmaa Ocean Analysis
Levitus (1982) global annual climatology
Levitus (1982) global monthly climatology
Temperature
Levitus (1982) global seasonal climatology
Merged IBCAO/ETOPO5 Topography
MSU
NAVAL OCEANOGRAPHIC OFFICE Bathymetry/Topography 5min resolution
NCAR OCMIP2 Abiotic
NCAR OCMIP2 Biotic
Done


File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/VizGal/VizGal.html?dsid=id-59f4b578f9&vid=sst-id-123456789&opid=
PMEL Remote Access Server - Home
LAS Data Gallery
LAS vizGal
Difference Mode
Z (meters):
0
Start date:
1985 Jan 04
Auto Set Color Fill Levels for Gallery
Image zoom:
Auto
Gallery Settings
Apply
Data Set
Plot Options
Select region
Select
All
Set center
Reset
POWERED BY Google
Terms of Use
Lat: 89.88 N
89.88 S
Lon: 0.12 W
0.13 E
Maps
Latitude-Longitude
Daily optimum interpolation(OI) SST: AVHRR only: Daily sea surface temperature
(See left)
Daily sea surface temperature (degrees C)
Start date: 1990 Jan 01
COADS monthly time series (1854-1993): Sea surface temperature
Settings
Cancel Panel Settings
Sea surface temperature (deg C)
Start date: 1990 Jan
Daily optimum interpolation(OI) SST: AVHRR only: Daily sea surface temperature
Settings
Daily sea surface temperature (degrees C)
Daily optimum interpolation(OI) SST: AVHRR only: Daily sea surface temperature
Settings
Daily sea surface temperature (degrees C)
Done

LAS VizGal - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://porter.pmel.noaa.gov:8920/baker/VizGal/VizGal.html?dsid=id-59f4b578f9&vid=sst-id-123456789&opid=

PMEL Remote Access Server - Home | LAS Data Gallery | LAS vizGal

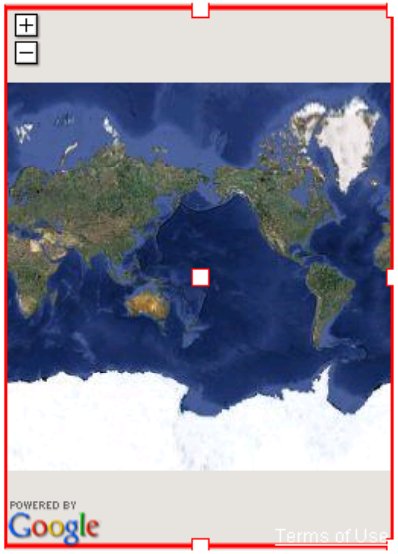
Gallery Settings

Apply

Data Set | Plot Options

Select region | Select | All

Set center | Reset



Lat: 89.88 N Lon: 0.12 W

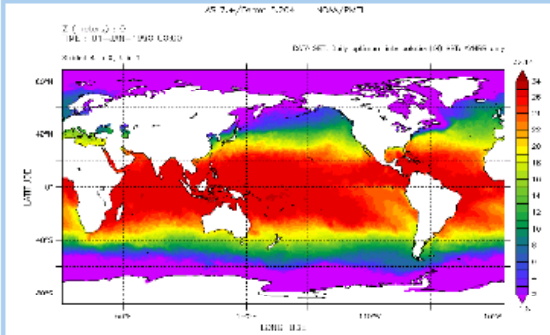
89.88 S 0.13 E

Maps

Latitude-Longitude

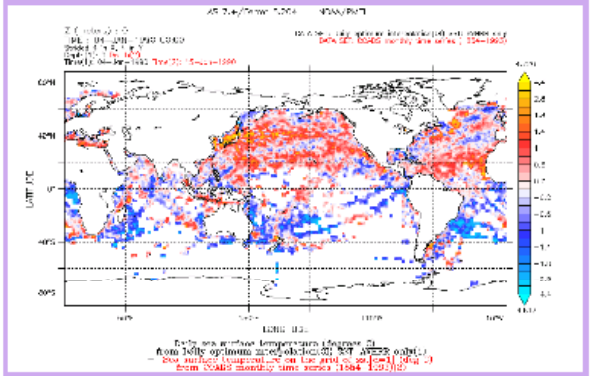
Line Plots

Daily optimum interpolation(OI) SST: AVHRR only: (See left)
Daily sea surface temperature



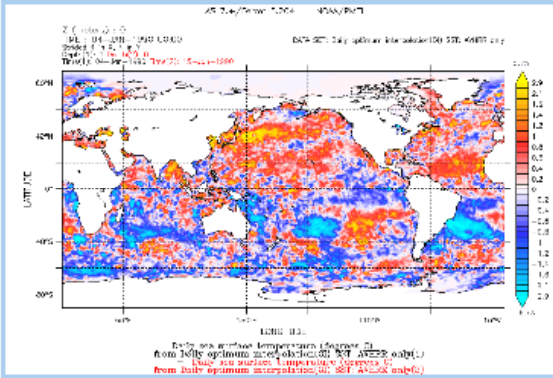
Start date: 1990 Jan 01

COADS monthly time series (1854-1993): Sea surface temperature | Settings | Cancel Panel Settings



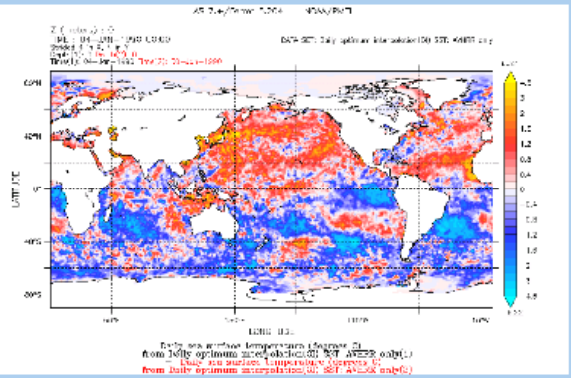
Start date: 1990 Jan

Daily optimum interpolation(OI) SST: AVHRR only: Settings
Daily sea surface temperature



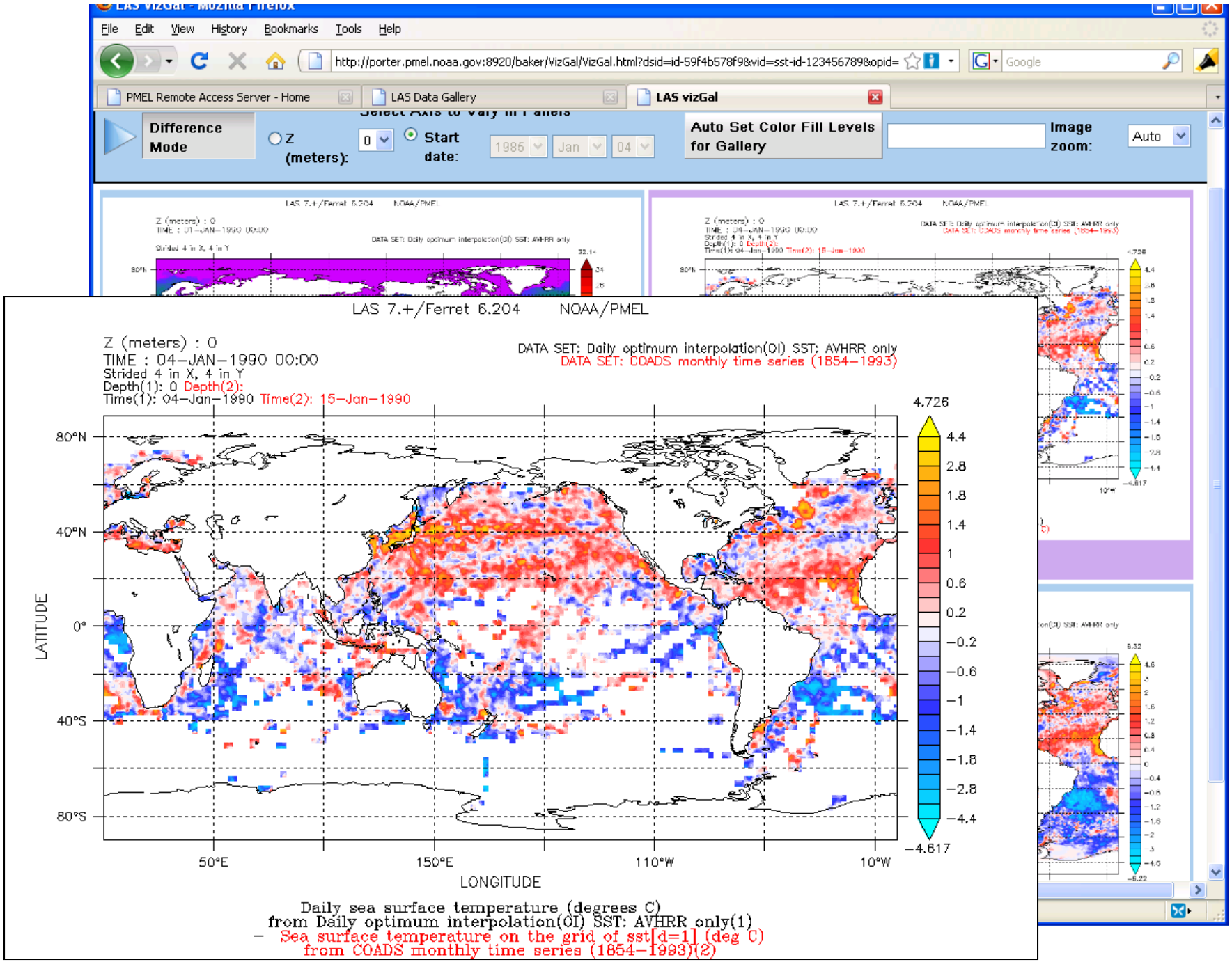
Start date: 1990 Jan 15

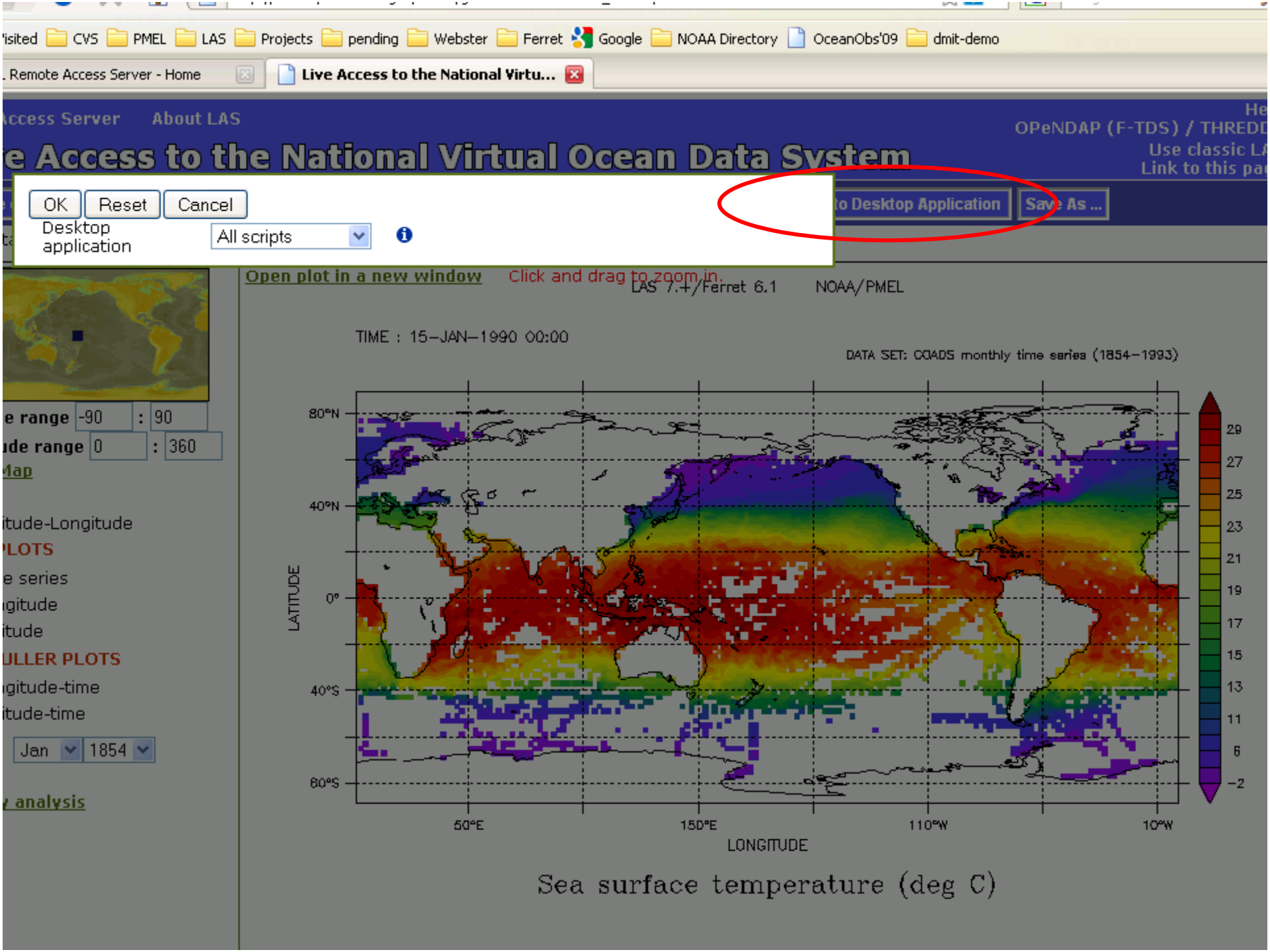
Daily optimum interpolation(OI) SST: AVHRR only: Settings
Daily sea surface temperature

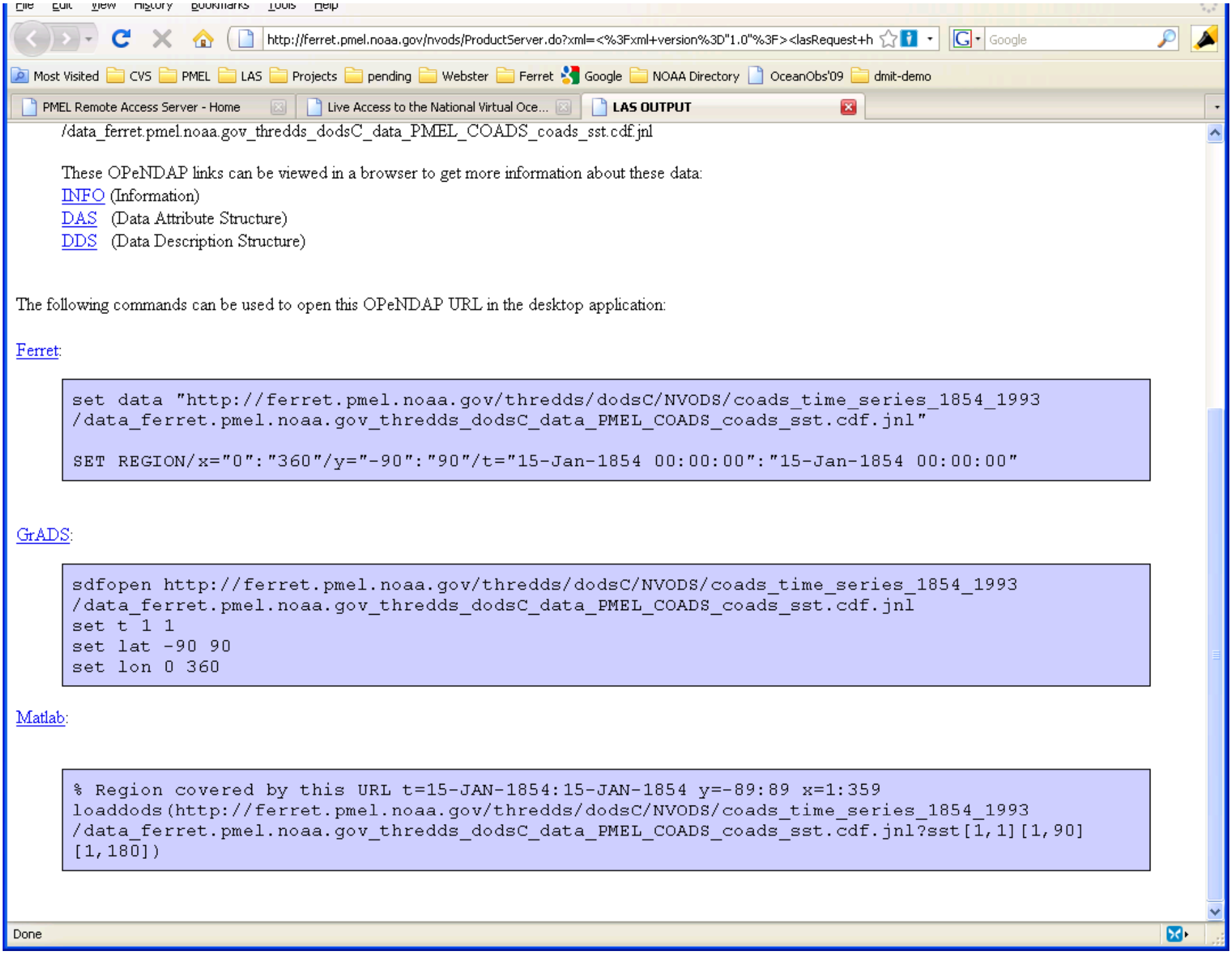


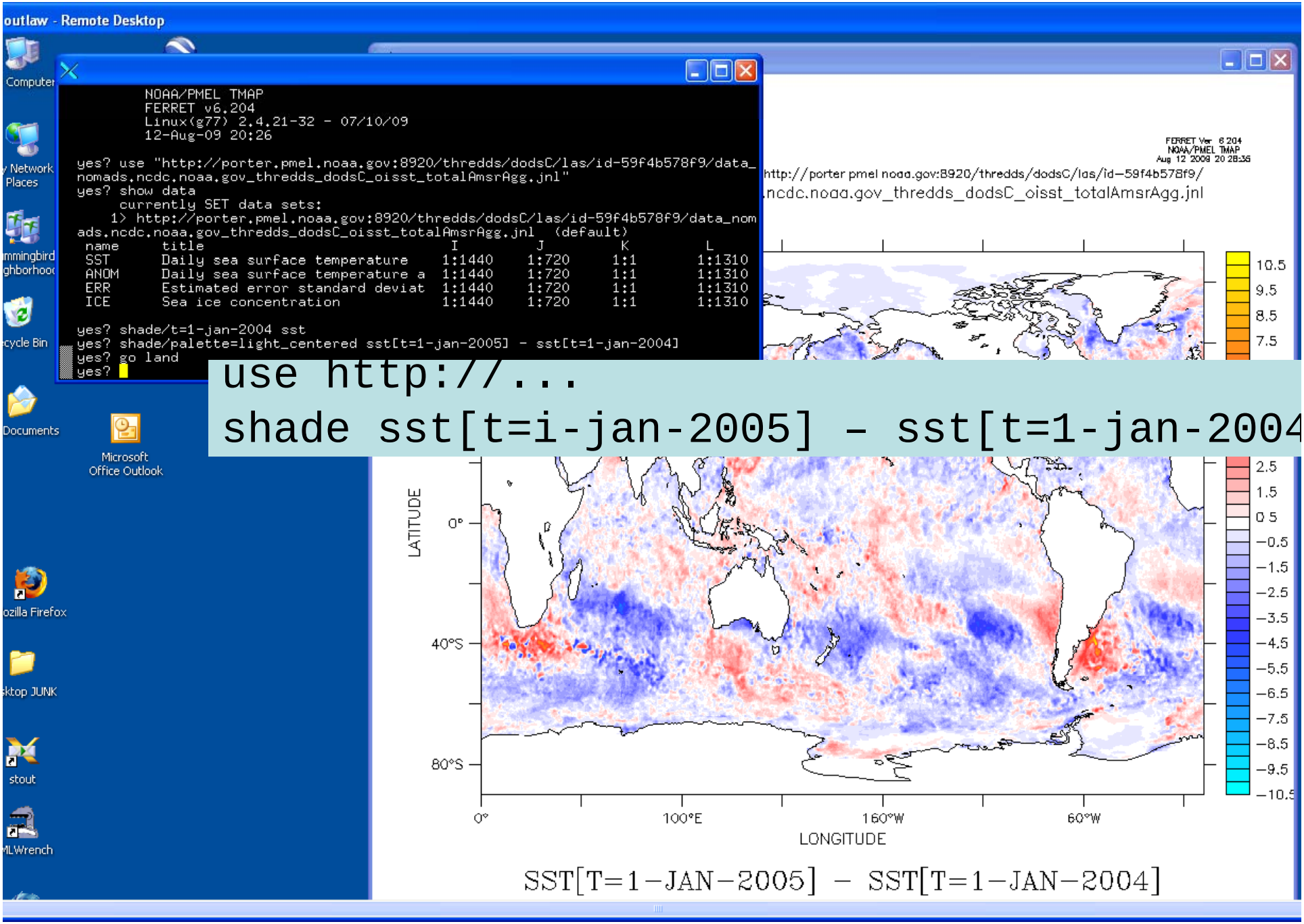
Start date: 1990 Jan 30

Done


File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/baker/VizGal/VizGal.html?dsid=id-59f4b578f9&vid=sst-id-123456789&opid=
PMEL Remote Access Server - Home
LAS Data Gallery
LAS vizGal
Difference Mode
Z (meters):
Start date:
Auto Set Color Fill Levels for Gallery
Image zoom:
Auto
LAS 7.+/Ferret 6.204 NOAA/PMEL
Z (meters) : 0
TIME : 04-JAN-1990 00:00
Strided 4 in X, 4 in Y
Depth(1): 0 Depth(2):
Time(1): 04-Jan-1990 Time(2): 15-Jan-1990
DATA SET: Daily optimum interpolation(OI) SST: AVHRR only
DATA SET: COADS monthly time series (1854-1993)
4.726
4.4
2.8
1.8
1.4
1
0.6
0.2
-0.2
-0.6
-1
-1.4
-1.8
-2.8
-4.4
-4.617
80°N
40°N
0°
40°S
80°S
LATITUDE
50°E
150°E
110°W
10°W
LONGITUDE
Daily sea surface temperature (degrees C)
from Daily optimum interpolation(OI) SST: AVHRR only(1)
- Sea surface temperature on the grid of sst[d=1] (deg C)
from COADS monthly time series (1854-1993)(2)


CVS
PMEL
LAS
Projects
pending
Webster
Ferret
Google
NOAA Directory
OceanObs'09
dmit-demo
Remote Access Server - Home
Live Access to the National Virtu...
About LAS
OPeNDAP (F-TDS) / THREDD
Use classic LA
Link to this pag
e Access to the National Virtual Ocean Data System
OK
Reset
Cancel
Desktop application
All scripts
to Desktop Application
Save As ...
Open plot in a new window
Click and drag to zoom in.
LAS 7.4/Ferret 6.1
NOAA/PMEL
TIME : 15-JAN-1990 00:00
DATA SET: COADS monthly time series (1854-1993)
80°N
40°N
0°
40°S
80°S
LATITUDE
50°E
150°E
110°W
10°W
LONGITUDE
29
27
25
23
21
19
17
15
13
11
6
-2
Sea surface temperature (deg C)
e range -90 : 90
ude range 0 : 360
Map
itude-Longitude
PLOTS
e series
gitude
itude
ULLER PLOTS
gitude-time
itude-time
Jan
1854
analysis

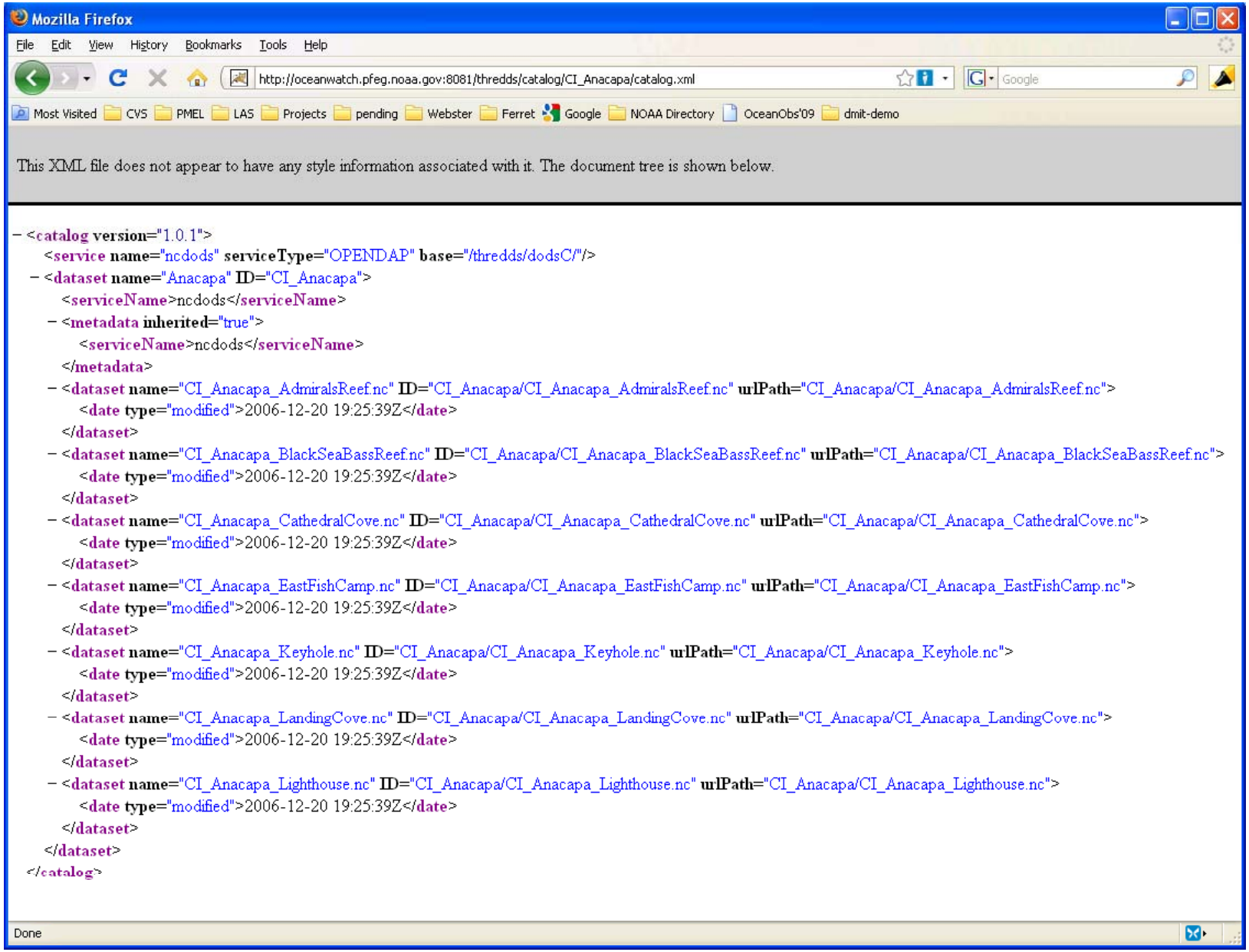

File Edit View History Bookmarks Tools Help
http://ferret.pmel.noaa.gov/nvods/ProductServer.do?xml=<%3Fxml+version%3D"1.0"%3F><lasRequest+h
Google
Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo
PMEL Remote Access Server - Home
Live Access to the National Virtual Oce...
LAS OUTPUT
/data_ferret.pmel.noaa.gov_thredds_dodsC_data_PMEL_COADS_coads_sst.cdf.jnl
These OPeNDAP links can be viewed in a browser to get more information about these data:
INFO (Information)
DAS (Data Attribute Structure)
DDS (Data Description Structure)
The following commands can be used to open this OPeNDAP URL in the desktop application:
Ferret:
set data "http://ferret.pmel.noaa.gov/thredds/dodsC/NVODS/coads_time_series_1854_1993
/data_ferret.pmel.noaa.gov_thredds_dodsC_data_PMEL_COADS_coads_sst.cdf.jnl"
SET REGION/x="0":"360"/y="-90":"90"/t="15-Jan-1854 00:00:00":"15-Jan-1854 00:00:00"
GrADS:
sdfopen http://ferret.pmel.noaa.gov/thredds/dodsC/NVODS/coads_time_series_1854_1993
/data_ferret.pmel.noaa.gov_thredds_dodsC_data_PMEL_COADS_coads_sst.cdf.jnl
set t 1 1
set lat -90 90
set lon 0 360
Matlab:
% Region covered by this URL t=15-JAN-1854:15-JAN-1854 y=-89:89 x=1:359
loaddods(http://ferret.pmel.noaa.gov/thredds/dodsC/NVODS/coads_time_series_1854_1993
/data_ferret.pmel.noaa.gov_thredds_dodsC_data_PMEL_COADS_coads_sst.cdf.jnl?sst[1,1][1,90]
[1,180])
Done


outlaw - Remote Desktop
NOAA/PMEL TMAP
FERRET v6.204
Linux(g77) 2.4.21-32 - 07/10/09
12-Aug-09 20:26
yes? use "http://porter.pmel.noaa.gov:8920/thredds/dodsC/las/id-59f4b578f9/data_nomads.ncdc.noaa.gov_thredds_dodsC_oisst_totalAmsrAgg.jnl"
yes? show data
currently SET data sets:
1> http://porter.pmel.noaa.gov:8920/thredds/dodsC/las/id-59f4b578f9/data_nomads.ncdc.noaa.gov_thredds_dodsC_oisst_totalAmsrAgg.jnl (default)
name title I J K L
SST Daily sea surface temperature 1:1440 1:720 1:1 1:1310
ANOM Daily sea surface temperature a 1:1440 1:720 1:1 1:1310
ERR Estimated error standard deviat 1:1440 1:720 1:1 1:1310
ICE Sea ice concentration 1:1440 1:720 1:1 1:1310
yes? shade/t=1-jan-2004 sst
yes? shade/palette=light_centered sst[t=1-jan-2005] - sst[t=1-jan-2004]
yes? go land
yes?
use http://...
shade sst[t=i-jan-2005] – sst[t=1-jan-2004
LATITUDE
0°
40°S
80°S
0°
100°E
160°W
60°W
LONGITUDE
SST[T=1-JAN-2005] – SST[T=1-JAN-2004]

Time series collection

- A standard THREDDS collection of NetCDF-CF files (“1D grids”)

Note: In this example we will see a (nearly) standard LAS server, but through an experimental custom UI that Roland Schweitzer built with the Google Web Toolkit (GWT) in a matter of days.


Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://oceanwatch.pfeg.noaa.gov:8081/thredds/catalog/CI_Anacapa/catalog.xml
Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo
This XML file does not appear to have any style information associated with it. The document tree is shown below.
<catalog version="1.0.1">
<service name="ncdods" serviceType="OPENDAP" base="/thredds/dodsC/"/>
<dataset name="Anacapa" ID="CI_Anacapa">
<serviceName>ncdods</serviceName>
<metadata inherited="true">
<serviceName>ncdods</serviceName>
</metadata>
<dataset name="CI_Anacapa_AdmiralsReef.nc" ID="CI_Anacapa/CI_Anacapa_AdmiralsReef.nc" urlPath="CI_Anacapa/CI_Anacapa_AdmiralsReef.nc">
<date type="modified">2006-12-20 19:25:39Z</date>
</dataset>
<dataset name="CI_Anacapa_BlackSeaBassReef.nc" ID="CI_Anacapa/CI_Anacapa_BlackSeaBassReef.nc" urlPath="CI_Anacapa/CI_Anacapa_BlackSeaBassReef.nc">
<date type="modified">2006-12-20 19:25:39Z</date>
</dataset>
<dataset name="CI_Anacapa_CathedralCove.nc" ID="CI_Anacapa/CI_Anacapa_CathedralCove.nc" urlPath="CI_Anacapa/CI_Anacapa_CathedralCove.nc">
<date type="modified">2006-12-20 19:25:39Z</date>
</dataset>
<dataset name="CI_Anacapa_EastFishCamp.nc" ID="CI_Anacapa/CI_Anacapa_EastFishCamp.nc" urlPath="CI_Anacapa/CI_Anacapa_EastFishCamp.nc">
<date type="modified">2006-12-20 19:25:39Z</date>
</dataset>
<dataset name="CI_Anacapa_Keyhole.nc" ID="CI_Anacapa/CI_Anacapa_Keyhole.nc" urlPath="CI_Anacapa/CI_Anacapa_Keyhole.nc">
<date type="modified">2006-12-20 19:25:39Z</date>
</dataset>
<dataset name="CI_Anacapa_LandingCove.nc" ID="CI_Anacapa/CI_Anacapa_LandingCove.nc" urlPath="CI_Anacapa/CI_Anacapa_LandingCove.nc">
<date type="modified">2006-12-20 19:25:39Z</date>
</dataset>
<dataset name="CI_Anacapa_Lighthouse.nc" ID="CI_Anacapa/CI_Anacapa_Lighthouse.nc" urlPath="CI_Anacapa/CI_Anacapa_Lighthouse.nc">
<date type="modified">2006-12-20 19:25:39Z</date>
</dataset>
</dataset>
</catalog>
Done

For example:

To add this tree branch to LAS:

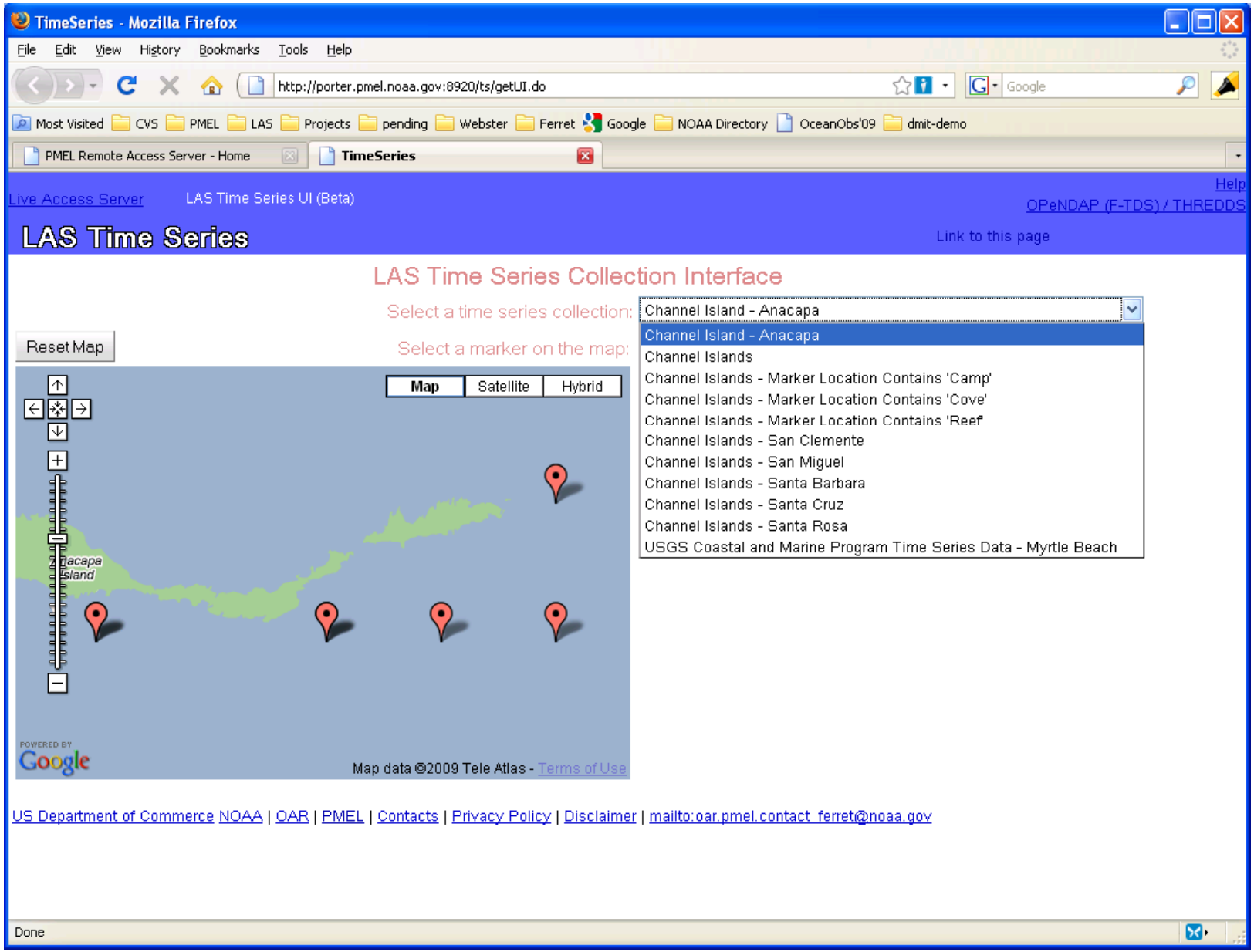
bin/addXML.sh

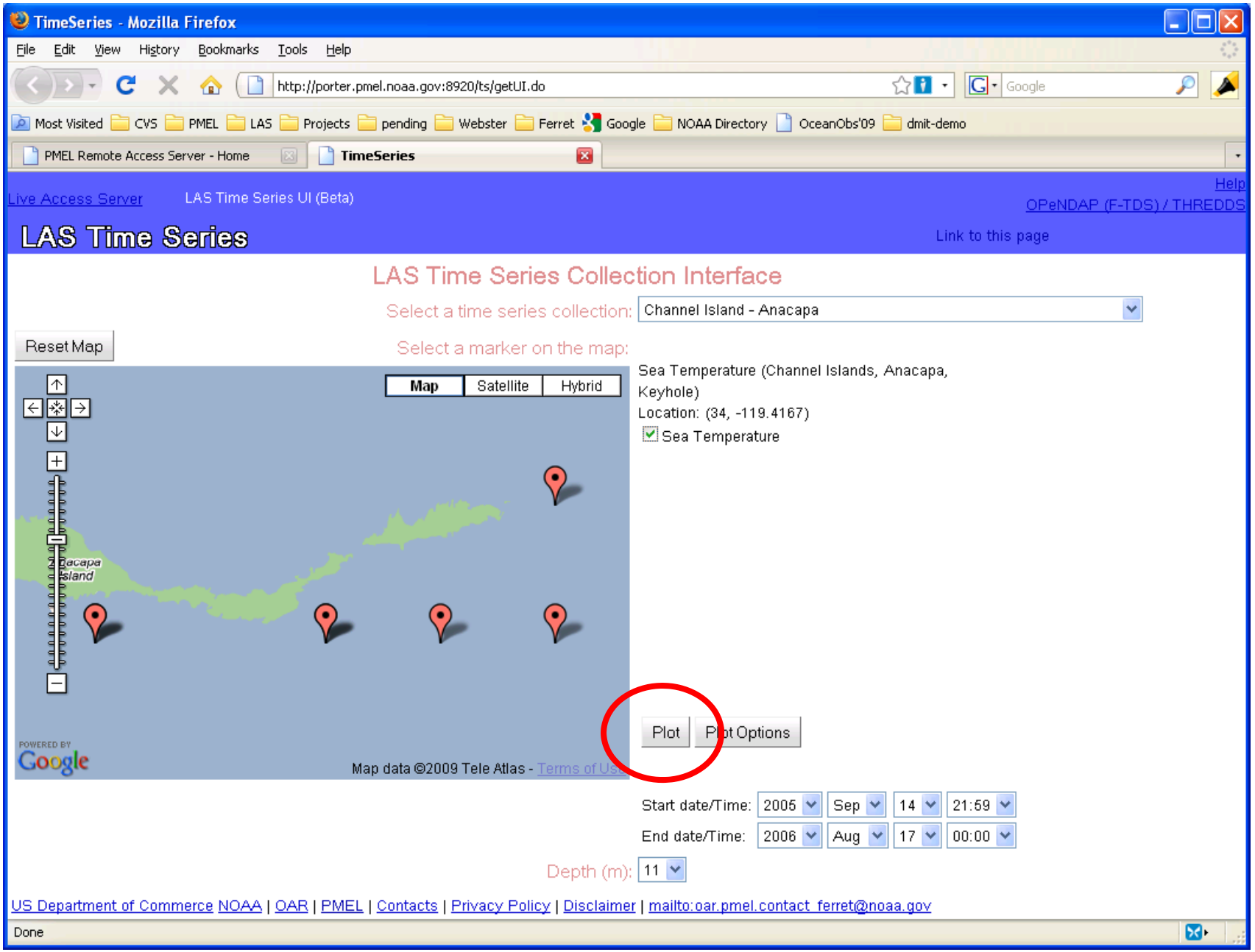
-T:time_series

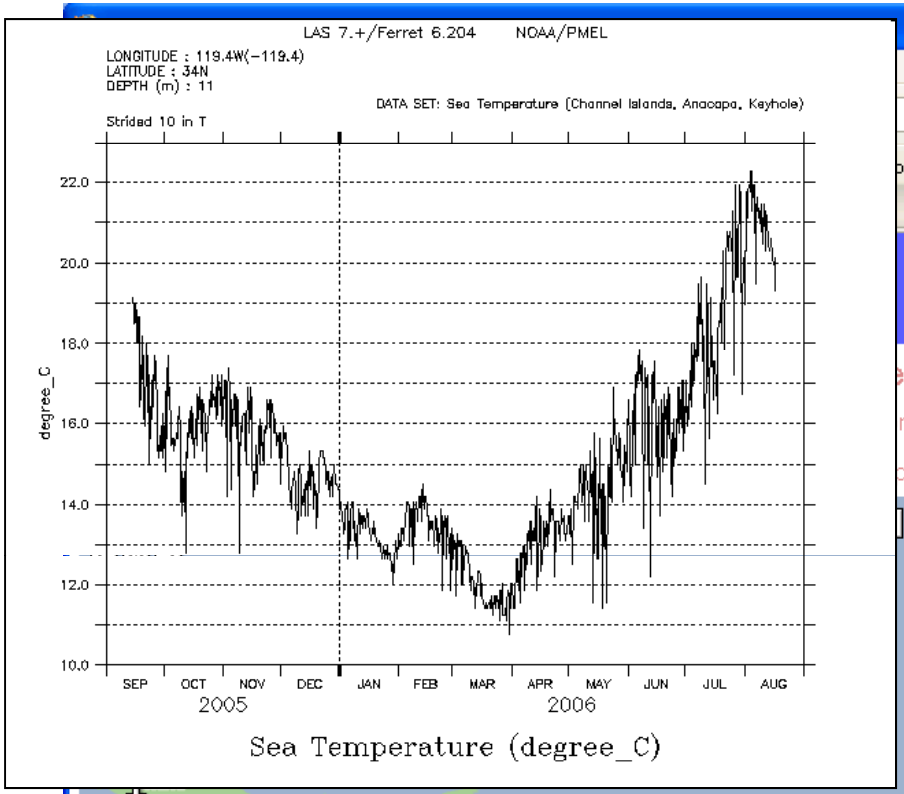
-G "Channel Islands - Anacapa“

-t

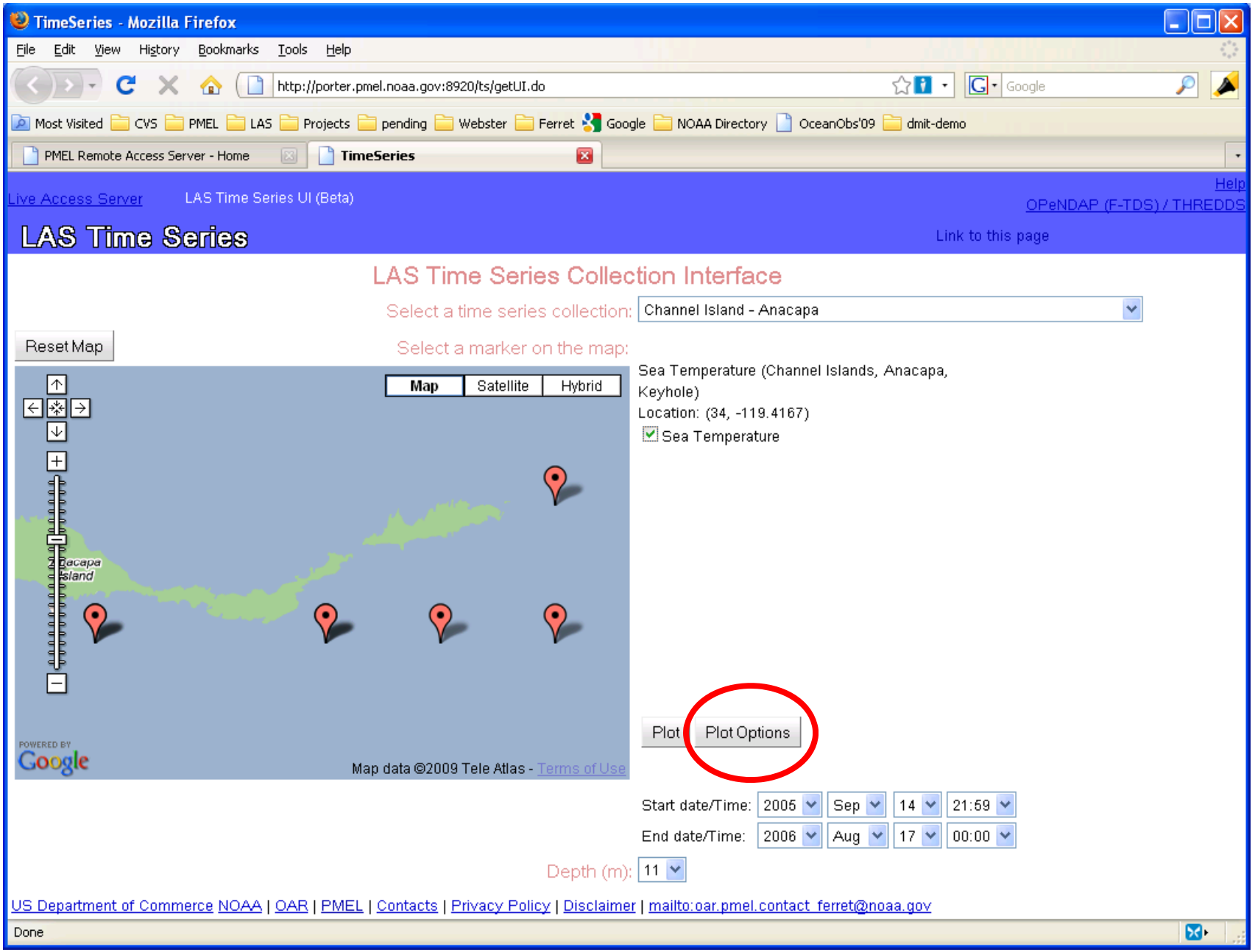
http://oceanwatch.pfeg.noaa.gov:8081/thredds/catalog/CI_Anacapa/catalog.xml

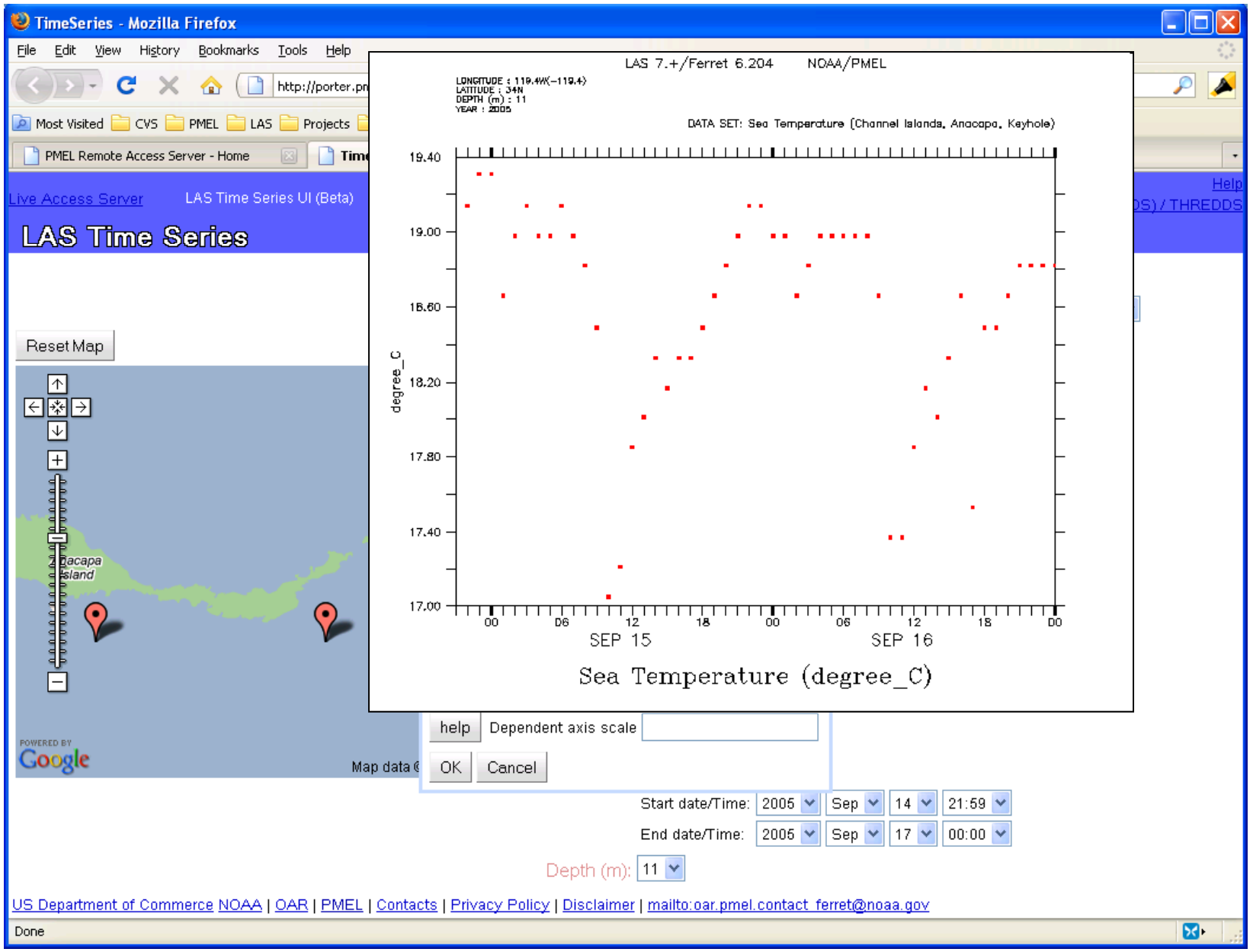

TimeSeries - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/ts/getUI.do
Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo
PMEL Remote Access Server - Home
TimeSeries
Live Access Server
LAS Time Series UI (Beta)
Help
OPeNDAP (F-TDS) / THREDDS
LAS Time Series
Link to this page
LAS Time Series Collection Interface
Select a time series collection:
Channel Island - Anacapa
Channel Island - Anacapa
Channel Islands
Channel Islands - Marker Location Contains 'Camp'
Channel Islands - Marker Location Contains 'Cove'
Channel Islands - Marker Location Contains 'Reef'
Channel Islands - San Clemente
Channel Islands - San Miguel
Channel Islands - Santa Barbara
Channel Islands - Santa Cruz
Channel Islands - Santa Rosa
USGS Coastal and Marine Program Time Series Data - Myrtle Beach
Reset Map
Select a marker on the map:
Map
Satellite
Hybrid
Anacapa Island
POWERED BY Google
Map data ©2009 Tele Atlas - Terms of Use
US Department of Commerce NOAA | OAR | PMEL | Contacts | Privacy Policy | Disclaimer | mailto:oar.pmel.contact_ferret@noaa.gov
Done


TimeSeries - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/ts/getUI.do
Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo
PMEL Remote Access Server - Home
TimeSeries
Live Access Server
LAS Time Series UI (Beta)
Help
OPeNDAP (F-TDS) / THREDDS
LAS Time Series
Link to this page
LAS Time Series Collection Interface
Select a time series collection:
Channel Island - Anacapa
Reset Map
Select a marker on the map:
Map
Satellite
Hybrid
Sea Temperature (Channel Islands, Anacapa, Keyhole)
Location: (34, -119.4167)
Sea Temperature
Plot
Plot Options
Map data ©2009 Tele Atlas - Terms of Use
Start date/Time: 2005 Sep 14 21:59
End date/Time: 2006 Aug 17 00:00
Depth (m): 11
US Department of Commerce NOAA | OAR | PMEL | Contacts | Privacy Policy | Disclaimer | mailto:oar.pmel.contact_ferret@noaa.gov
Done


LAS 7.+/Ferret 6.204 NOAA/PMEL
LONGITUDE : 119.4W(-119.4)
LATITUDE : 34N
DEPTH (m) : 11
DATA SET: Sea Temperature (Channel Islands, Anacapa, Keyhole)
Stride 10 in T
22.0
20.0
18.0
16.0
14.0
12.0
10.0
degree_C
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
2005
2006
Sea Temperature (degree_C)

Google
NOAA Directory
OceanObs'09
dmit-demo
Help
OPeNDAP (F-TDS) / THREDDS
Link to this page
ection Interface
Channel Island - Anacapa
Sea Temperature (Channel Islands, Anacapa, Keyhole)
Location: (34, -119.4167)
Sea Temperature
POWERED BY Google
Map data ©2009 Tele Atlas - Terms of Use
Plot
Plot Options
Start date/Time: 2005 Sep 14 21:59
End date/Time: 2006 Aug 17 00:00
Depth (m): 11
US Department of Commerce NOAA | OAR | PMEL | Contacts | Privacy Policy | Disclaimer | mailto:oar.pmel.contact_ferret@noaa.gov
Done


TimeSeries - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://porter.pmel.noaa.gov:8920/ts/getUI.do
Most Visited CVS PMEL LAS Projects pending Webster Ferret Google NOAA Directory OceanObs'09 dmit-demo
PMEL Remote Access Server - Home
TimeSeries
Live Access Server
LAS Time Series UI (Beta)
Help
OPeNDAP (F-TDS) / THREDDS
LAS Time Series
Link to this page
LAS Time Series Collection Interface
Select a time series collection:
Channel Island - Anacapa
Reset Map
Select a marker on the map:
Map
Satellite
Hybrid
Sea Temperature (Channel Islands, Anacapa, Keyhole)
Location: (34, -119.4167)
Sea Temperature
Map data ©2009 Tele Atlas - Terms of Use
Plot
Plot Options
Start date/Time: 2005 Sep 14 21:59
End date/Time: 2006 Aug 17 00:00
Depth (m): 11
US Department of Commerce NOAA | OAR | PMEL | Contacts | Privacy Policy | Disclaimer | mailto:oar.pmel.contact_ferret@noaa.gov
Done


TimeSeries - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Most Visited CVS PMEL LAS Projects
PMEL Remote Access Server - Home
Live Access Server
LAS Time Series UI (Beta)
LAS Time Series
Reset Map
Anacapa Island
POWERED BY Google
Map data
LAS 7.+/Ferret 6.204 NOAA/PMEL
LONGITUDE : 119.4W(-119.4)
LATITUDE : 34N
DEPTH (m) : 11
YEAR : 2005
DATA SET: Sea Temperature (Channel Islands, Anacapa, Keyhole)
degree_C
19.40
19.00
18.60
18.20
17.80
17.40
17.00
00 06 12 18 00 06 12 18 00
SEP 15
SEP 16
Sea Temperature (degree_C)
help
Dependent axis scale
OK
Cancel
Start date/Time: 2005 Sep 14 21:59
End date/Time: 2005 Sep 17 00:00
Depth (m): 11
US Department of Commerce NOAA | OAR | PMEL | Contacts | Privacy Policy | Disclaimer | mailto:oar.pmel.contact_ferret@noaa.gov
Done

Conclusions

1. A wealth of gridded datasets already available through OPeNDAP
   - “Repairs” are fairly easy to make using NcML (and other techniques)
2. Web and desktop tools already exist that can effectively “integrate” and present the data
   - A rich tool-building environment makes it quick to develop new ones
3. Data discovery and metadata management machinery can leverage the wealth of information available through THREDDS catalogs and self-describing datasets